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ABSTRACT

A collection of ten papers selected from those presented at the CEC Southwest Regional Conference (Vancouver, British Columbia, October 29-30, 1970) considers teaching strategies, methods, and instructional materials in special education. An optometrist's view of perceptual training for children with learning problems; developmental vision and learning; the role of the educator in assessment; an examination of an educational methodology; a theoretical framework for the establishment of a special education instructional materials center network in Canada; preschool training for the sensory age retarded child; development of critical thinking through use of the Guilford model; cooperation and interaction of American and Canadian special education; and a report on the panel concerning a regional resource center for handicapped children and its impact on Northwest schools are among papers included. Other papers from the conference are collected and available as EC 031 525 (Pre and Inservice Teacher Training), EC 031 526 (Social and Institutional Changes in Special Education), EC 031 527 (Administrative Procedures and Program Organization), and EC 031 530 (Involvement of Parents in School Programs). (CD)

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Exceptional Children Conference Papers: Teaching Strategies, Methods, and Instructional Materials

Papers Presented at the
Northwest Regional Conference
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PREFACE

Teaching Strategies, Methods, and Instructional Materials is a collection of 12 papers selected from those presented at the CEC Northwest Regional Conference, Vancouver, British Columbia, October 31 - 24, 1973. These papers were collected and compiled by The Council for Exceptional Children, Arlington, Virginia. Other collections of papers from the conference have been compiled and are available from the ERIC Document Reproduction Service. Other collections announced in this issue of *Research in Education* may be found by consulting the Institution Index under Council for Exceptional Children or the Subject Index under Exceptional Child Education. Titles of these other collections are:

Involvement of Parents in School Programs
Pre- and Inservice Teacher Training
Social and Institutional Changes in Special Education
Administrative Procedures and Program Organization

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AN OPTOMETRIST LOOKS PERCEPTUAL TRAINING FOR CHILDREN WITH LEARNING PROBLEMS

Robert E. Payne
Lake Oswego, Oregon

Our research, over the years, has shown that there is an integration of all sensory processes. One process cannot be separated entirely from all the others. This concept is not new, but it seems we have been looking to the knowledge of how the individual integrates the various sensory stimuli into meaningful experience. This is the basis for this presentation.

We will be dealing with the ability of the visceptor to identify the visual processes and integrate the various sensory stimuli into basic visual patterns which will enable the human being to learn. This concept is the multi-sensory approach to vision which was presented in "A Field of Vision and Basic Principles Involved", in the November-December 1971 issue of the Oregon Optometrist. The field of vision has evolved out of our association with the visual problems of children and has been the basis for developing the testing and training procedures we use.

This model of vision is based upon the state of the visual system as the organism is visually centered and processing information derived from the area of sight. The large circle in the center represents the area of visual perception.

As the organism changes his centering from sight to auditory, the central circle now becomes the area of auditory perception. The central perceptual area changes accordingly, as the organism continues to change his centering to each of the other sensory areas.

In general, when the organism is centered upon a certain sense area, the sensory stimuli from that area becomes figure. All other sensory stimuli then become ground.

(2)

The staff of the Optometric Extension section on Child Vision (one and Louisiana, has made a tremendous effort bringing about our present day concept of developmental vision. This approach has not been easy but one which encompasses the research and thinking of all the professions dealing with the growth and development of children.

As we in Optometry have integrated this research into our current thinking the concept that we are working with a single organism, which we label a human being, has become firmly established. Furthermore, whatever we do to that human being will affect his total being. The biological principle that the organism is a product of its environment takes on more meaning. Gestalt Psychology has done much to further this concept. It states that the whole is not the sum of its parts but that it has a unique value all its own. As we change the relationship of its parts the value of the whole changes.

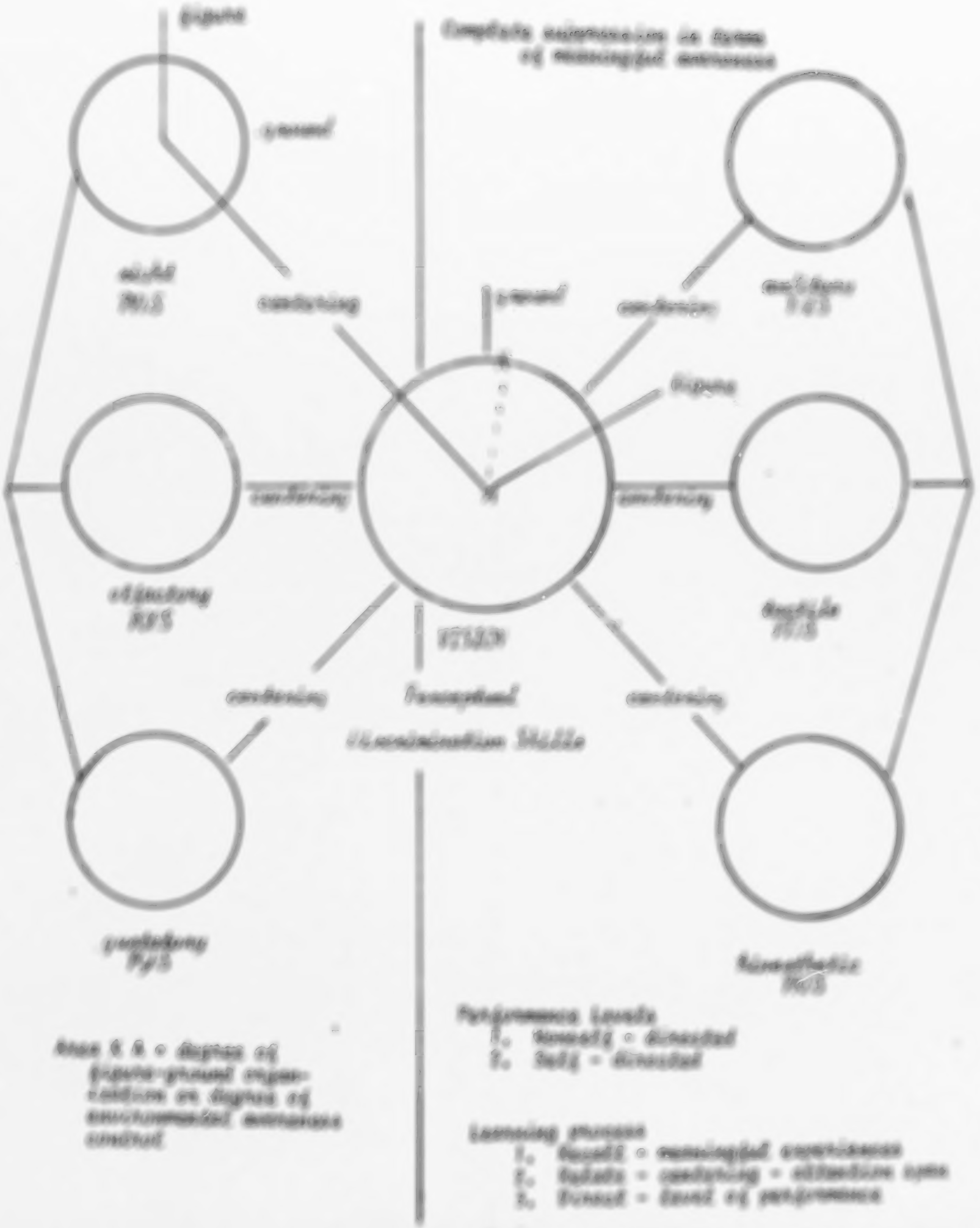
Our work with children and their visual problems has brought about two basic changes: one, to learn more about the effect of the environment on the child as a whole; and two, to determine the basic visual process to be used in helping the child to more successfully communicate with his environment. These visual processes involve an area of learning about which, in the past, little has been known. Kephart and Cleaning, in the book LEARNING DISORDERS VOL. 1, state, "With all the test instruments and skills the psychologist brings to bear in his diagnostic processes, he does not have any effective measure of the learning ability." As one reviews the literature he finds a definite lack of information concerning the basic process used in learning.

Developmental Optometry has contributed much in the area of vision that may be related to how a child learns. There must be a coordinated effort on the part of all professions to integrate their knowledge. Helping the child to realize his greatest potential should be the ultimate goal.

Perception appears to be a common ground where the various professions should meet in mutual understanding of what each has to offer. Past research has followed the lines of studying each area as a unit, instead of the integration of all sensory stimuli into a single function. The Gestalt concept supports integration.

Optometry is concerned with vision. If we are to understand the function of vision, a study of the human organism's ability to visually process information while performing under the influence of each of the other sensory stimuli is in order. The processing of issues in visual training therapy must be related to the patient's visual performance as he functions in a constantly changing sensory environment.

As are concerned with the visual functions taking place as the organism processes information derived from the sense of sight. As we study other areas, we must determine what effect they have upon the function of vision. If we find areas that are inhibiting the visual performance of the organism then we refer the problem to qualified individuals who are trained in that area.



Area S.R. = degree of figure-ground organization or degree of environmental demands placed

Performance Levels
1. Memory = Directed
2. Skill = Directed

Learning process
1. Recall = meaningful experiences
2. Habits = conditioning = attention span
3. Pursuit = Level of performance

(9)

Figure-ground Organization

The newborn infant's first awareness of his new environment is through his "six senses". A good way to visualize this would be to think of the various senses as antennae, each "zeroing in" a stimulus to the perceptual area. To survive in this new world the organism must develop the ability to centre on one sensory stimulus, and be able to relegate the others to a secondary or supporting role which we will call ground. The primary stimulus will be referred to as figure.

Figure-ground organization is a basical process and can be seen functioning throughout the entire perceptual system. Figure-ground is the perceptual ability of the individual to centre on one sensory stimulus and relegate the other stimuli to the background. An example of this in the auditory area would be the attempt by the individual to centre and identify a single sound against a background of noise. Each of the sensory areas, illustrated in the model, involve figure-ground organization.

Visual Processes

Over the years our relationship with children has brought about an awareness of the presence of certain visual processes and their function. A team approach has been used. It is with the aid of a tactual assistant, recording the movement patterns of each child during the training sessions that we have been able to gain a deeper insight into the function of the visual processes.

Various factors involved in the function of the visual process must be clearly understood. Based on the model the definition of vision would be: "The function of the total visual processes whereby the organism is able to interpret the environment in terms of meaningful experiences." Further clarification of the factors involved in vision would be as follows:

1. Visual Centering may be interpreted as the ability of the individual to fix attention of the mind and body on a visual task.

    A. There must be a mid coordinated performance involved and the performance must be one of self direction.

b. The individual must have the ability to exclude peripheral sensory stimuli (figure-ground) to the extent that he is not distracted from the visual task confronting him.

c. He should have the ability to recognize the peripheral stimuli and be able to use or interpret them in a selective manner (figure-ground).

2. Stress is the overall factor which affects the perceptual figure-ground organization.

a. Stress induced which does not touch down this organization will most like ly be used to bring about a centering on perceptual set.

b. The more meaningful the stress stimulus becomes, the greater will be the tendency of that stimulus to become figure. Therefore, when inducing a stress stimulus, quality instead of quantity is the important factor.

3. The <u>Basic Learning Paths</u> involves the function of the following three areas.

a. Recall - The searching and bringing forth past experiences.

b. Relate - The relating of these past experiences to the present task or situation.

c. Direct - The visual directing of a response based upon the Recall - relate. The response will be either nonself-directed or self-directed.

As we establish communication with the child, the learning process of Recall-Relate-Direct takes on more meaning. The observation of his movement patterns as he relates to his environment allows us almost to pinpoint and follow his visual processes. We may not be aware of the child's past experience, but by observing his reactions to the environmental stimuli, we can almost visualize his experiential background.

4. <u>Performance Levels</u> are of two kinds and there are various degrees of proficiency in each level.

(7)

A. In the non-self-directed level, the stimulus to perform the act originates outside of the body. The individual reacts to the stimulus in a manner which he has previously learned and does automatically. This involves a lower neurological process.

B. In the self-directed level the stimulus to perform the act originates from within the body. This involves a higher neurological process. One may think of this as being a problem solving or reasoning level.

5. The Principle of Learned Performance can be illustrated as follows:

A. An individual is asked to self-direct a movement pattern which he cannot do automatically and as he is performing this act, a sensory stimulus is induced into the perceptual area. Next, the stress level of the stimulus is increased slowly until the frustration level is reached. At this point there occurs a breakdown of the figure-ground structure. This may be observed as a sharp reversal back to that movement pattern he does automatically. When the stress reaches a point where he cannot self-direct his performance, there is a reversal back to the non-self-directed type of performance.

6. Frustration Level is that point where there occurs a complete visual breakdown in the figure-ground structure in the perceptual area. This level may vary from one time to another and from one sensory area to another. It is directly related to the figure-ground organization.

7. Visualization is the process whereby a mental image is perceived by the individual. The degree of visualization will be based upon the efficiency of the entire visual system. The figure-ground organization of the moment will be the determining factor in his ability to visualize.

(8)

5. Visual Discrimination Skills are the skills used by the individual to differentiate the differences and similarities in his environment.

   A. Size
   B. Space
   C. Form
   D. Direction
   E. Color

One of the basic characteristics common in all low achievers is the inability to visually process information in depth. This statement is most applicable to those individuals who have not developed the basic readiness skills necessary for learning.

Observation of the communication patterns of these individuals reveals that they are using a skimming type of information processing. They are communicating in terms of generalities instead of specifics. Good performers are able to go into depth, thus, utilizing the fine details of an activity and get not loosing sight of the central theme.

The human organism receives information from environmental stimuli through its sensory modalities. All modalities are integrated into a sensory system which takes on the function of Gestalt. If one sensory modality cannot function in depth to the same degree as the others there will take place an inhibition of meaningful integration. Consider an individual auditorily centered and processing information at a certain depth. If the environmental stimulus changes from an auditory to a visual stimulus and his visual skills are not sufficiently developed to allow him to function at the same level as the auditory skills, there will be a decrease in the meaning of the information he processes. This could result in a breakdown of communication between the individual and his environment. It could possibly lead to the loss of the central theme and the goal of his activity. You could say that the person is side tracked.

(9)

An individual must develop the function of figure-ground in all sensory modalities and integrate the total stimuli into a gestalt function. This will then allow him to relate to a constantly changing environment. The perceptual discrimination skills of size, space, form, direction and color play a very important part in the function of figure-ground. These skills are all learned in various degrees. Under stress the perceptual skills least learned will have a tendency to drop out first, thus, causing a distortion in the meaning of the information he receives through his sensory system.

The state of function of the discrimination skills can be determined by the use of the flannel board procedure. A clinician places one of a selection of flannel pieces on a flannel board, flashes it, and the patient must then match it in regards to form, space, size, direction and color. * The procedure is continued, gradually increasing the demand by adding one piece at a time to the pattern on the board. A point will soon be reached where the child will not be able to match the demand of the test pattern. This will give us valuable information regarding the amount of information the child is processing at one time. These skills are all trainable and the amount of information an individual can visually process can be appreciably increased through training.

If any one of the perceptual discrimination skills of identification does not function properly then there will be a distortion in the meaning of the information processed. This will inhibit the individual's ability to relate past experiences to present demands and to direct the movement patterns necessary to allow him to function in his environment. If a person is getting meaning from his environment he is learning and will therefore, be functional and better able to adapt to changes of the various environmental demands.

* As illustrated in the manual DEVELOPMENTAL VISION, A Multi-sensory Approach to Learning, by Robert C. Pepper, O.D.

DEVELOPMENTAL VISION AND LEARNING AND THE SCHOOL

Charles F. Hill

Wilsonville Elementary School

The opportunity to relate the effects of Developmental Vision Training to the future education of low achieving students was afforded by the Portland School District during its model school summer session at Woodlawn School from June 23 to July 31, 1969. Dr. Robert Selby, principal of the 600 student school and director of the summer school program, worked closely with Dr. Robert Peppe to set up the experimental program. Eight optometrists, a recording secretary, and an elementary school principal composed the training and research group. Four teams of two optometrists each were responsible for the training of 20 students, giving them 5 students per team. They met three mornings each week in sessions of 45 minutes per pupil for a total of 30 sessions.

The students receiving Developmental Vision training were given a vision examination by the participating optometrists. They also received preliminary developmental vision screening examinations during this initial contact in the doctors' offices. Any students with indications of pathological vision problems were subject to referral to the proper medical authority and the parents of these needing corrective lenses due to non-pathological development were notified.

The 20 students for developmental vision training were chosen by an set criteria except that the teachers were asked to select the students in their classes who exhibited the worst behavior problems, had difficulty communicating, were slow learners, had speech problems, were truant, or exhibited any behavioral syndrome that may be a symptomatic of sensory, emotional, psychological, physiological, mental or social abnormalities. These students were quickly identified as was a group of alternates. It was anticipated that many of the students would drop out of the training as they mentally, if not physically, dropped out of school. It must be noted here that none of the participating optometrists were given background information on any student as their school records were not available prior to the summer workshop.

Of the students initially placed in the visual training group, two dropped out through disinterest and one due to illness. They were replaced by others during the session. Two students had irregular attendance and did not receive full benefit of the schooling. This attendance was better than expected when the students' school problems and the fact that the sessions started at 7:15 A. M. were considered. Six students attended every session, six missed once and three were absent twice. It is felt that most of the students enjoyed the therapy and did not look upon it as work and they became fully involved in what they were doing.

Full I.Q. scores for 14 of the students ranged from 73 to 111 with eight in the 90-99 range; four from 90-99; and one at 105. Portland math test scores ranged from the 30th percentile to the 62nd percentile and the reading scores ranged from the 32nd to the 67th percentile. There were no test scores available for the other students.

In nearly every case self-control was difficult for these students and they exhibited classic patterns of withdrawal or aggressiveness and short interest spans. Five were in or had been under speech therapy while four had verbal difficulties such as poor speech patterns and reversals. All were under-achievers and most had poor self-concepts of themselves as students and in many cases had accepted defeat as their lot. There also were not self-directed and could not center on most classroom tasks.

On the second day of the summer school session, Dr. Pepper met with summer school teachers and administrators to outline the training program and encourage them to observe the sessions whenever possible. A few teachers observed during the first two weeks but interest grew during the third as they became more aware of the changes taking place in many of the trainees. Questions were asked and a second meeting with Dr. Pepper during the third week resulted in increased enthusiasm for what was taking place. Information and comments about the students began to be filtered to the optometrists as the communicated more frequently and freely with the teachers.

During the fourth week of therapy, the teachers were frequent visitors to the training sessions and reported behavioral changes they were observing in the students. Many of them were very enthusiastic and expressed an interest in a workshop to acquaint them more fully with the Developmental Vision and Learning philosophy and procedures.

Also visiting the training sessions were the students who were undergoing the training. They delighted in watching other students perform tasks and tried to distract them as much as possible. They brought friends to the training rooms to watch them perform and were elated that they could do complex procedures on the trampoline.

In retrospect it is possible that there few visitors to the therapy sessions during the first week or two because they felt they would be a distraction to the students but as the school staff became more aware of the therapy objectives they discovered that although these students had been distractable most were no longer that way. During the last week one student did admirable work while seven adults watched him. During this time he was being bombarded with noise, questions, and directions from three optometrists.

The purpose of developmental vision training is to prepare an individual to visually process information under a constantly changing environment with a minimum of effort. This necessitates the ability to perform under various stresses and distractions that under normal conditions would not bother the average person but will disrupt an individual who has a low frustration level in any of the sensory areas. As the stimulus increases, of course, it can reach the breaking point for any person, even one having an extremely high distraction tolerance. In school terms this can be termed the "attention span" and is a product of the constantly changing environment.

The second part of the purpose is to process the information with the least amount of effort. Any new task requires a maximum amount until one understands the procedure. It then becomes decreasingly difficult and less effort is expended until that particular phase is mastered.

Inherent in the philosophy of Developmental Vision and Learning is the belief that most individuals are capable of not only processing information but can do it on a higher level than at present. That the whole being and all the senses are brought into play when processing. That various sensory areas operate singly or in groups but are dependent upon the visual perceptual development of the being. That vision goes beyond the act of seeing and encompasses the total visualization process that results in an accurate perception of the visual stimulus. That a stimulus elicits the need for a specific sense to dominate and the others to recede in dominance in relation to their need. That the learner must be challenged with tasks within his ability and just below his frustration level. That the learner must always feel a sense of achievement and that assessment is always positive and immediate.

The techniques and procedures used were somewhat similar with each of the students. Extensive use was made of the rotator, trampoline, chalkboard and flannelboard. The area of difficulty being experienced by the student dictated the initial procedures used.

Assessment of the student's perceptual area causing difficulty provided a point of departure. These sensory areas were primarily visual, auditory, and kinesthetic. One student was decidedly distracted by the tactile and could not stand being touched. Most had poor bilateral development and space orientation was generally low with directionality a problem. All broke down under various stress patterns and as a rule visual-motor match was low.

Of the twenty students starting the program, sixteen attended seven or more times which would seem to be a range of attendance within which behavioral changes might take place. As a general observation, the following changes took

place with all students:

1. They became less distracted by audio, visual and tactile stimuli.
2. Their abilities to center on a task improved.
3. Their "attention span" lengthened.
4. Their self concepts improved.
5. They had confidence that they could perform new tasks and succeed.
6. When they failed tasks they were willing and eager to try again to succeed.
7. They became more self directed and able to plan what they we did do.
8. They were able to perform increasingly more difficult directed activities.
9. They performed tasks beyond which would normally be expected of them in the classroom.
10. They were better able to visualize their space world.
11. They were able to perform several physical tasks while doing arithmetic problems or spelling at the same time, indicating improved concentration.
12. They enjoyed the training and worked hard while in the sessions.

A rating scale was filled out by the teachers for each student in the class. The first rating was done the first week of the workshop and the second during the last week to determine what behavioral changes had taken place in each of the two experimental groups and the control group. This was a Diagnostic Schedule of Pupil Human Relationships adapted by Dr. Selby from Haring and Phillips' "Educating Emotionally Disturbed Children". Individual ratings showed an average gain of .66 for the developmental vision group. It was felt that this gain was good considering the caliber of students composing the group and the short time they were in training.

Comments and subjective evaluations by the summer school teachers indicated that most of the visual training students had become more receptive to instruction, had extended attention spans and had improved somewhat in social behavior. Although no followup activities were provided for the following academic year, it was concluded that some or use of incorporating the students back into the classroom environment should be developed. Developmental vision training is designed to make the student ready for the learning process. It is the schools' responsibility to provide the education.

Concurrent with and following visual training the under achiever should receive the necessary remedial instruction from the special services department to build basic skills and concepts. A functional curriculum should be planned and put into effect with proper evaluation procedures.

The prescriptive instruction should be evolved cooperatively by all school and auxiliary personnel having any instructional function to perform with under achievers. They should be able to use the principles of Developmental Vision and Learning as well as those being used by special services.

The Developmental Learning Center model illustrates a means of bringing together as a team all those who can directly and indirectly help the under achiever. Its composition and organization may vary with the available resources. It may be on a regional, district or individual school basis. It would include the present special services department plus the visual training therapist, psychologist, nurse, teacher aides, student aides, community resource people, parents and any other available personnel. Its function is to make the student receptive to instruction, provide necessary remedial instruction, fill in the students' educational gap, provide in-service training, supply materials for classroom instruction, and design a vital functional program based on the principles with which he has been trained.

Some of the principles as they relate to Developmental Vision and Learning are:

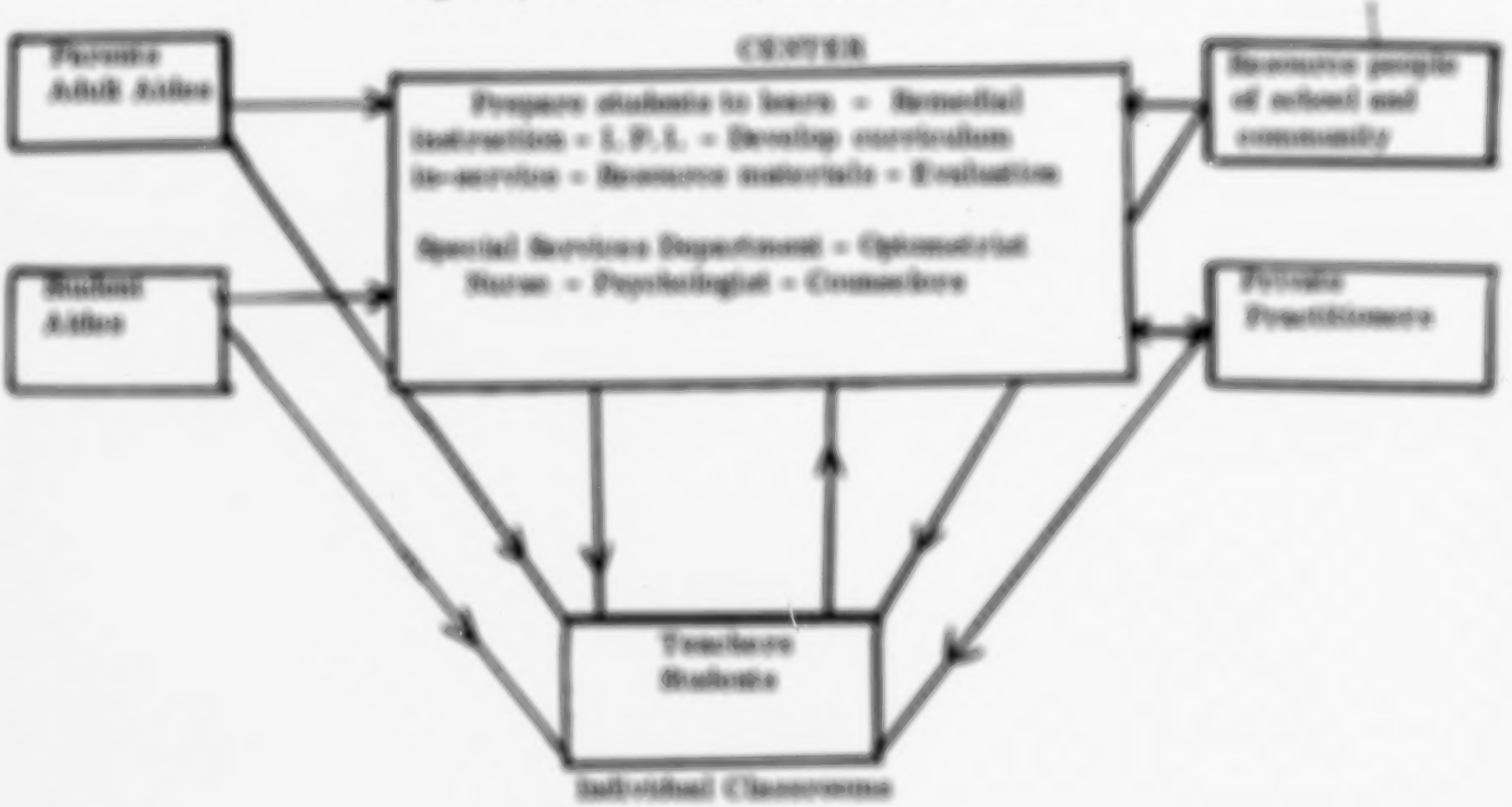
1. The academic tasks must be within the student's environmental world. It must be close and vital to him and within his understanding.
2. Concepts concerning his relationship to the academic tasks must be established.
3. No task should force him beyond his frustration level.
4. Each task should be challenging and enjoyable.
5. He should progress toward becoming increasingly more self-directed.
6. He should be able to process information and perform tasks with decreasing energy expenditure.
7. He should be able to center on tasks for greater lengths of time.
8. Correct responses should be immediately imbedded and reinforced.
9. Quality rather than quantity is of primary importance.
10. Progress should be constantly evaluated in terms of behavioral changes.
11. He must be able to process information in a constantly changing environment.
12. Performance should progress from skimming to greater depth.

Perceptual training as it has been developed by optometrists has great

potential as a supplement to the special service departments of school districts. The principles and techniques are highly refined and done under clinical conditions but are adaptable to a training center utilizing the services of an optometrist trained in Developmental Vision and Learning procedures.

DISTRICT/INTERMEDIATE LEARNING CENTER

Regional, School District, or Individual School


CENTER
Prepare students to learn - Remedial instruction - I.E.P.'s - Develop curriculum in-service - Resource materials - Evaluations
Special Services Department - Optometrist Nurse - Psychologist - Counselors
Teachers Students
Individual Classrooms

The Center gets the student ready to learn; provides remedial instruction; refers to private practitioners; trains para-professional aides; develops curriculum; provides resources; counsels students, teachers and parents; evaluates progress, and maintains continuous communication with the classroom teacher.

Parents, aides and students are trained to work with the low achiever in the center, classroom and/or home.

Private practitioners may work in the center with personnel and students, or in their offices. They may be retained as consultants or on a referral basis.

Resource people of the community should be utilized to help develop a functional curriculum for the students.

Teachers receive training, work with students in the center and classroom, and be constantly assisted by Center personnel.

THE ROLE OF THE EDUCATOR IN ASSESSMENT

Joan Gershaw
Toronto Board of Education, Ontario

When the pediatricians, neurologists, psychologists and all have seen the neurologically impaired, minimally brain damaged learning disabled, or what-have-you child. When all reports have been written, parents counselled, then the school system must pick up the ball. Hopefully this same school system is well-supported by the above disciplines just mentioned, because if it is the responsibility of the school system to design the best possible program for each child who is designated as having learning and behavioural problems, then supportive services are a necessity.

In ideal circumstances we have a generous amount of specific and pertinent data to hand. We have information as to the cause of the disability, development of the child, and areas of strength and weakness in learning potential.

In the last few years we have become much more sophisticated in the interpretation of this data as we begin our programming in terms of the rehabilitation of the whole child. An excellent approach is that of "Task Analysis". This is Diagnosis - Prescription - Program to meet the needs of every child. This demands that psychologist and educator talk the same language even if their approaches differ due to their disciplines. The teacher must know what psychological tests, test, so that their interpretation is meaningful. She must really know child development and be cognizant with theories of learning so that she is able to recognize where the children in her care deviate from the norm.

May I give you a simple example. If the diagnosis is that the child has poor time concepts, this just doesn't mean that he can't tell the time, but that he has little concept of time in relation to life and to himself. Therefore the prescription is to teach him the days of the week, months

of the year, seasons, holidays, time past, present and future, all in relationship to each other and to himself as well as reading time off the clock. Therefore, in the program you might use moveable clocks, moveable calendars, class birthdays, day in relation to night, and so forth.

However, that is only the very beginning. One of the necessary skills of the special educator, in fact of all educators, is ongoing, perceptive, intelligent observation well recorded. The information gained from such observation can change or modify the specific program for the specific child.

You have all read books and articles defining the behaviour and learning disabilities of some neurologically impaired children, therefore they will only be mentioned in relation to classroom assessment and evaluation.

The age at which Johnny arrives in your program, the type of neurological deficit - be it definite, measurable hard neurological evidence, or soft neurological signs, be it demonstrably uneven development in the acquisition of motor or language skills - all have particular bearing on your planning. If Johnny is still in the 6 1/2 to 8 year age level it is probable that he has not yet acquired the overlay of frustration and poor self-image due to constant failure which so often result in secondary emotional problems. If he is older your first encounter might go something like this: "I can't read. Nobody has been able to teach me to read, and I'm not going to learn." Under the defiant boldness there is usually fear and desperation. He "knows" he isn't stupid, yet it appears that he can't learn.

As a teacher you can't divide Johnny into neat little compartments labelled "social development", "motor development", "academic progress" and so forth. He's a living, breathing, and very much with you on the negative side, human being. Often he is an hyperactive, impulsive, manipulative, socially unacceptable illiterate, and he's there from nine o'clock on Monday morning to half-past three on Friday afternoon. In essence he embodies all the particular things which are non-acceptable in school situations. The fact that he may also have overwrought, anxious

deepening parents coupled with "fed-up-to-the-teeth" siblings cannot be overlooked.

Johnny is with you, in your program. As an educator you have to try to change behaviour in the accepted psychological definition of the term.

Now that all this has been said you must have some organization to your own observation. Therefore we will revert to arbitrarily defining behaviour under the following headings.

Social

How does he operate within the group? Is he an isolate? Does he annoy the other children? Does he spoil their games so that he is always left on the fringe? Is he accepted by the other children (a reasonable time must elapse if the group is close) or does he relate poorly to his peer group? Does he constantly bicker and argue with his classmates? Can he be trusted to play in a reasonable fashion in the playground, or is he in constant trouble through his lack of a "braking" system? Most children know what kind of behaviour is acceptable, what is not. This child may lack social perception to such an extent that although he is truly sorry about a bloody nose, a blackened eye, or a cut lip, it is highly probable that similar incidents will occur the next time he is allowed outside.

Is he socially imperceptive of the feelings of others so that he upsets the other children without knowing why? Is he so socially immature that he is only comfortable playing with much younger children, and therefore his life-style is that of a younger child.

Is he restless with short attention span no matter what the given task? Does he perseverate? Is he constantly demanding the teacher's full attention and very resentful when she gives her time to others?

Does he lack flexibility so that he becomes abnormally upset when a schedule or routine is changed? Does he "fall apart" under the slightest pressure? Is he so anxious that this anxiety seems to overwhelm ?

From ongoing observation of children who exhibit clusters of such characteristics, it is frequently a waste of effort to concentrate on the academic aspects of learning until one has succeeded in changing the social behaviour of the child. Observation shows us that the affective cannot be seperated from the cognitive.

Uneven Development

Is there an obvious imbalance in the developmental areas? What is his language level compared with his motor level? Some children may be almost precocious verbally, and yet the control and mastery of their bodies may be at a much younger level. In large motor activities a child may be so poorly coordinated that he lacks the skills to throw or catch a ball, control balance, learn to skate, play peer group games and so forth. On the other hand, some children may show a noticeable developmental lag in language, while their performance abilities might be very efficient.

Some children at 11 years of age may physically and emotionally be more like eight year olds. We are not talking about innate intelligence here, but rather about how a child exhibits highly uneven development even when reared within the same socio-economic cultural environment. Uneven development, whether the cause is neurological or cultural, can be a significant cause of school failure. Schools often pay lipservice to individual differences and child development, but they still operate to a large extent on chronological age norms. In intelligent observation a particular child must be considered in the light of his developmental levels. If his motor level is that of a four year old, then big and small muscle activities must be geared to that level and not to the grade expectancies of the average seven year old. If at nine years his language level is only five, then at the time he is taught the beginnings of phonics it is meaningless to him as ear training, although he may pick up visual cues.

Language Development

This must be emphasized under a heading of its own because of its vital importance in school learning or non-learning. We know from studies of underprivileged children that their language levels on entrance to school are usually two or more years retarded. It is not only that they have insufficient vocabulary but that they have not developed the language concepts necessary to abstract thinking. Hence they are unable to operate on a level necessary to a general understanding and enrichment of life. As a result, school, which is highly language oriented environment, places such children behind the eight ball from the first day in kindergarten.

Any child who has a late language development or impairment in the language area of the brain, is often not ready for the activities of the primary grades because he lacks listening skills, interpretation of language and facility with verbal language which are the tools he needs in order to do an efficient job of learning.

Observe - Can he listen?

Can he listen and understand?

Can he listen, understand and reproduce verbally?

Understanding of language makes for understanding of the mores of society even at the relatively simple level of the child. If any of you have worked with severely aphasic children you know how difficult it is to get through the concepts of family life and sex education to adolescents who have little understanding of the abstractions of language. You can project the concrete actions of sex and reproduction visually, but it is much harder to help them really understand the abstract facts of social do's and don'ts attached to such behaviour.

It is necessary to observe whether the child is just talking words at a superficial level, or if he is truly organized in his language understanding and thinking. Social maturity is very much related to the ability to really communicate verbally.

Observation of language of course includes observation of auditory perception and memory which play large roles in learning to read. Does your six year old speak in whole organized sentences, however simple, or do we hear odd words or phrases. Can he relate a simple story in sequential order? Can he remember and follow through a number of verbal instructions?

Does your eight year old truly perceive the differences in letter sounds and their association with words, or does there appear to be a sound-symbol break? Can he reproduce for you the sounds in isolation yet be unable to hear how they operate in code-breaking a word ?

We also have children whose verbal skills are on a far higher level than their skills in reading. Marshall McLuhan or not, schools are still operating to a large degree in a print culture.

Children who watch T.V., listen to radio, visit museums, art galleries and zoos, listen to high level conversation from well-educated parents and intelligent siblings, yet who cannot break the code of print may become emotional and social casualties. You have read reports from medicine, psychology and education. You are confronted with a bright non-reader. The media centre at school is very attractive to him. He gets satisfaction from movies, film strips and tapes, but to him books are an anathema.

His visual perception of shape is highly inefficient. Psychology has told us this. He often cannot recognize the configuration of the letters of the alphabet let alone remember them. One of the greatest present evils of our school system is the slavish devotion to the experience approach to reading. It is excellent for developing verbal language (but this particular child already has this skill), but it offers only one code-breaker for reading - the whole word sight approach. If a youngster can't learn that way he does not learn to read.

Therefore, if you have a bright, verbal child, interested in many things,who has been exposed to school at least two years beyond kindergarten, but who is still a non-reader, even if he has memorized a number of words, then the approach should be an analytical breakdown of the configuration of letters and words, coupled with a verbal cue-in. The IRA or Sullivan approaches

do this. Tactile kinesthetic aids to integration of letter and word shapes should also be incorporated.

Observation of the child who learns to read but who is incapable of putting down onto paper the simplest word or sentence with anything remotely resembling correctness is another insight to learning disability. He is not sloppy, or uncaring. He is often accused of not trying. Although the feed-in mechanism and integrative facilities appear intact there is a breakdown in the perceptual integrative motor mechanism. He cannot produce what he sees and reads. He cannot write on the lines, he mirror writes, or consistently transposes letters or numbers. Sometimes he cannot actually form letters because he doesn't know how.

Faulty eye movement and poor accommodation can hinder reading facility. The youngster may go left-right and then suddenly switch and go right-left. He will skip words and skip lines. He will substitute and misread. Therefore the actual manner in which he reads may result in confusion or faulty understanding of what is read. If you know what you are observing and what these observations mean in relationship to efficient reading you can plan accordingly.

The bright child with this disability soon learns he must cover up his disability and uses a great deal of energy in attempting to hide his deficiency.

Such children actually have to be taught to reproduce lines, line shapes and letters. The motor patterns of how such letters as "a" or "h" or "w" are formed must be taught because although youngsters with such a disability can look at the letters and read them, they cannot reproduce what they actually see. Again a tactile-kinesthetic approach with verbal cuing may help, but it is a long hard way before the writing process comes easily. Such a child needs help in sequencing, otherwise letters or numbers become confused, transposed, and even inverted.

This youngster usually copies very poorly. He cannot organize science or social study notes, therefore he produces little of any readable value. He cannot write creative English because although he knows what he wants to say when it is put down onto paper it is so poorly organized and impossibly spelled that it is completely unsatisfactory. For other children the integrative motor

task is impossible and what goes down resembles "gobbledy-gook".

Observation of teenage students exhibiting learning problems which are presumably organic in origin shows that they also lack organization in their approach to work. Notes often miss the most important information, are sloppy, not in order, and give the impression that the student is unaware of the whole subject. Books and materials are forgotten or mislaid. Assignments and directions are not carried through or completed because they are quite literally lost in the mind jumble-up.

In reading they often miss the whole point of story or paragraph rendering work meaningless. Spelling is frequently atrocious due to faulty sequencing which has never been overcome.

The student usually has few friends and does not relate well with his peer group. He is often the drop-out, or the individual who ends up in a job which is much below his innate intelligence, resulting in more frustration.

The role of the teacher is to observe the student in relation to his subject teachers. Does he really understand what he's supposed to do? Can he organize his work? Can he learn to meet assignment deadlines? Can he work through his timetable so that he's at the right place at the right time? Can he overcome his insufficient work habits? To a large extent he can, but he needs specific diagnosis of his learning problem plus teaching to his deficiencies and constant, on-going supportive help.

It is all too evident that poor self-concept, social immaturity and communication inadequacies, blocked by anxiety cause the neurologically malfunctioning child to grow ever farther apart from his non-handicapped peers. More specific diagnosis, teaching techniques geared to the child's deficiencies, continuing supportive services to the teacher and the parents will help education reach some positive goals for these youngsters. What we must always remember is that a child is what he is at any moment in time bringing with him to school his own reactions against positive or negative environment. Succeeding in school only if he can learn to overcome his social, emotional and academic problems.

EDUCATIONAL METHODOLOGY: AN EXPLORATION OF APPROACH

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Abstract

Potentially effective educational procedures have often been lacking due to the absence of a serviceable model for research and information dissemination. Recent developments in major project networks provide a vehicle for implementing programmatic efforts toward improvement. A model is discussed which promises additional short- and long-term advancements in instructional methodology.

Considerable concern has been voiced about the lag between research findings and classroom practices. Estimates of this lag range widely from 25 to 50 or 75 years depending on who is estimating and for what purpose. Both the practitioner and the researcher are quick to identify causes for this lag. Each, from his respective vantage point, seems to find a large part of the lag due to the other's shortcomings. It is the purpose of this paper to examine certain aspects of this problem, where efforts to date have led us, and to suggest a model or approach to partially circumvent this difficulty.

Means for transmitting information concerning educational materials and/or techniques to the classroom have previously resembled a rather inefficient process of osmosis. A substantial portion of this process is left to chance occurrence. As a consequence the existence of the much discussed "shot-gun" philosophy of education is perpetuated.

Teachers become aware of new techniques and materials primarily through word-of-mouth information or from commercial venders. Because of this, the criteria involved in selection are seldom based on the demonstrated effectiveness of the product. Decisions are frequently made on the basis of the salesman's proficiency or what another teacher has heard concerning a given product. Additionally, many of the materials or techniques on the commercial market are not developed by qualified professionals. A valid evaluation of these products is often difficult for the practitioner to obtain. Until the recent development of the Instructional Materials Center Network, Regional Resource Centers and similar projects, no systematic vehicle was available to undertake this problem. Although these Centers have yet to reach their maximal effectiveness, they do present a viable means of bridging the gap between the laboratory and the classroom.

As a consequence of the present situation, teachers are often forced to work in situations where adequate information concerning materials and techniques is lacking. This contributes to a number of behavioral outcomes which are not conducive to effective education. First of all, we often find a frustrated group of teachers whose intellectual activity is stifled by the practicalities of surviving in the classroom. Because of the paucity of options open, many teachers become primarily routine implementors. This tends to perpetuate the uncomplimentary (often derogatory) concept of a teacher held by those outside the profession. Secondly, the lack of systematic, high quality information tends to prevent a maximal quality of teaching from being attained. In particular, Special Education must be concerned with this point. The efficacy of special class placement has been seriously questioned (e. g. Dunn, 1968; Peretch, 1968; Blatt, 1958). Methodological weaknesses plaguing these investigations have been well documented (Kirk, 1964; Gunzle and Gardner, 1968). Methodology, however, must not become an excuse for lack of concern about effective instruction. It is incumbent upon the Special Educator to provide evidence justifying his approach.

Education, and to a greater degree Special Education, seems to be extremely vulnerable to fads and fantasy concerning instruction. Part of this vulnerability can be attributed to the necessity of education remaining responsive to social realities. Another portion can most probably be attributed to a heightened emotional state of our society when dealing with matters concerning our youth. Despite these and other sources, a substantial portion of this susceptibility can probably be accounted for by a pervasive lack of instructionally relevant information.

Our present philosophy logically offers very little evidence which would predict change in degree or approach of improvement for education. As noted above, when put to the acid test of empiricism, educational effectiveness is often disappointing. This is not too surprising since empirical evidence, of necessity, requires criterion measures. Since criterion measures spring from hypotheses or models as a base for operation, development of such a tool would seem to be a logical first step.

A Vehicle for Change

The current development of "Networks of Knowledge" by federal funding presents a viable vehicle for increasing the effectiveness of educational research. Many professionals have been forced to become articulate about common goals and objectives of the discipline. Change has not thus far, however, been maximally effective for a number of reasons.

Due to increasing pressures from the field, initial-phase objectives of these projects aim at increased immediate service to public agencies. This was and is a valid and most worth-while effort. The profession must not, however, purchase short-term, stop-gap improvements at the cost of sacrificing valuable long-term achievements. Many project proposals included research goals as an integral part of their mid-phase objectives. Presently this objective is approaching an operational status. The decision must now be made whether research will merely be given lip service or actually function as an active, useful tool in improving educational effectiveness.

In many projects to date, no systematic model has been established for research on: 1.) investigation of specific situational instructional requirements or needs, and 2.) materials and/or techniques to meet these instructional needs. In terms of immediate service, most efforts have thus far primarily evaluated existing materials. This function has been of substantial assistance to the practitioner. This function has not, however, been maximally effective due lack of systematic model upon which to base evaluation. Because of this lack of a common frame of reference, a viable criterion measure is often absent. As a consequence, evaluations are often in the form of vague narratives which are based on subjective opinion. Thus, although this service has provided substantial improvement, optimal effectiveness has yet to be evidenced.

An Alternative Approach

Most products or services on any market are (or are not) in demand because of some characteristic that distinguishes them from their competition. At the same time, the purchaser of these commodities selects a given product over others because of some unique characteristic. Thus, it seems that, when conceptualizing a "buyer-seller" world, we can speak in terms of primary distinguishing characteristics. These are the characteristics that identify the unique strengths (or weaknesses) of a product and the unique requirements of a situation.

The educational process can be conceptualized in much the same way. In a given instructional setting (which may include relevant factors such as student sensory deficits, intellectual ability, reading difficulty, environmental variables, etc.) a certain combination of instructional

instructional goals. Optimal instruction must be responsive to and effectively account for these primary distinguishing characteristics of the instructional requirements. Educational materials and techniques likewise have primary distinguishing characteristics (PDCs). Some procedures may emphasize auditory or visual presentation. Others may provide for a combination of low word introduction settings and extensive review.

With the foundation of PDCs as a point of departure, logic dictates the next step to be the construction of a PDC profile for both the instructional requirements and the procedure or material available. This is necessary since educational settings present various combinations of variables. Idealistically, maximally effective instruction will take place when there is a perfect interface of the two PDC profiles. In reality, existing materials and techniques may not provide a profile which will perfectly match. In this case, various combinations of interface approximations must be considered.
Figure 1 illustrates various PDC interface combinations.

Insert Figure 1 about here

It would seem to be the task of research to identify factors relevant to the instructional process (instructional requirements) with various types of children. Subsequently, the identification and testing of techniques, procedures and materials to maximize instructional effectiveness under various combinations of instructional requirements will be needed. If an effective PDC interface is unavailable, the professional could hopefully then develop procedures to fill the gap.

The task set before the researcher above seems to be a very large one. It will necessitate a programmatic research effort which systematically delineates the relevancy of variables involved in effective habilitation. Further, a systematic variation of research environs is required to improve the usefulness of research findings. This may be maximally facilitated by programmatically phasing the research from controlled laboratory settings through experimental classrooms until all "real world" influences are allowed to operate.

Possible Results

The PDC approach will result in both immediate and more long-range influences on the instructional process. Initially, evaluation of existing materials and procedures from this frame of reference will result in more effective service to the practitioner. This function would be improved to at least a twofold manner. First, utilization of such an approach will produce more reliable and useful evaluations just because their evaluations have a considered model as a common conference. As a consequence, one

any logically support (and empirically test for) some error reduction (more precision) in identifying the appropriate tool for a given set of instructional requirements. The practitioner is thus provided more reliable information.

The second improvement may be accrued by the extension of this model to the function of information dissemination. By utilizing PIAC as the information base for comparison, computerization of storage and retrieval function becomes mentally effective. This would result in a computer printout in the form of a matrix of ratings on the relevant PIAC. Using PIAC as entries in the rows, the various materials/procedures under consideration may be entered as columns. A rating system such as the Likert scale (1-very unfavorable to 5-very favorable) will allow the body of the matrix to be used for comparison of the various characteristics. This permits a twofold comparison in any PIAC matrix. One can compare the relative quality between characteristics within a given material plus compare the various attributes between materials. Figure 2 exemplifies the type of matrix print-out which may be obtained.

Insert Figure 2 about here

The further utility of this model perhaps speaks more directly to long-range objectives of most projects. Using the PIAC model, certain gaps in the profile interface will often exist (refer to Figure 1). In this case the researcher is in an ideal situation to work towards the development of materials and techniques which will more effectively meet the need. It is possible that modification of existing material may satisfactorily alter the profile. In other situations, development and fabrication may unnecessarily begin from scratch. It matters little at this point whether a project then becomes a materials development agency or the materials are produced commercially. What is important is that the qualified professional has served the critical function in the development. Further, that which is developed, be it materials or procedures, is more readily subject to empirical investigation.

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FIGURE 1

Example of PDC Profile Interface

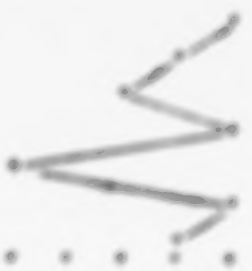
Relevant Factors	Likert Scale (1-very low, 5- very high) Special Consideration Provision	Special Consideration Provision
	1 2 3 4 5	1 2 3 4 5
Reading level Concept intro. rate Interest level Amount of review Visual Presentation Auditory presentation Stimulus complexity		
	1 2 3 4 5	1 2 3 4 5
Reading level Concept intro. rate Interest level Amount of review Visual presentation Auditory presentation Stimulus complexity		
	1 2 3 4 5	1 2 3 4 5
Reading level Concept intro. rate Interest level Amount of review Visual presentation Auditory presentation Stimulus complexity		
	Instructional Requirement PDC Profile	Material or Procedure PDC Profile

FIGURE 7

Example Matrix Print-Out of

Hypothetical Material PDC Ratings

Relevant Factors	Materials				
	A	B	C	D	E
READING LEVEL	5	4	3	4	3
CONCEPT INTRODUCTION LEVEL	4	4	4	5	2
INTEREST LEVEL	3	2	3	2	5
AMOUNT OF REVIEW	5	3	2	3	2
VISUAL PRESENTATION	1	4	3	1	5
AUDITORY PRESENTATION	5	3	1	1	1
STIMULUS COMPLEXITY	4	4	3	2	4
CONSTRUCTION DURABILITY	2	3	3	4	1
ILLUSTRATION QUALITY	3	4	3	2	4
COST/INITIAL	2	4	3	4	4
COST/HANDLING	4	2	3	1	1
SUPPLEMENTARY ACTIVITIES	2	3	2	1	4
STORAGE REQUIREMENTS	3	4	2	3	4
URBAN RELEVANT	3	1	3	4	2
RURAL RELEVANT	3	5	2	2	4

A THEORETICAL FRAMEWORK FOR THE ESTABLISHMENT OF A SPECIAL EDUCATION INSTRUCTIONAL MATERIALS CENTER NETWORK IN CANADA

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James J. McCarthy, a professor at the University of Wisconsin, states that the American Special Educational Instructional Materials Centre "Network is designed to become a permanent organization locally controlled and locally funded. It is to serve and be guided by special educational personnel to better help them serve handicapped children. Network services are, or will be, available to every special educator in the United States."

James J. Gallagher, an outstanding special educator, explains that "the basic objective of the Instructional Materials Centres is to shorten the communication lag between those who have the necessary knowledge and skills, and those educators who need and wish to use them."

These two statements could well be accepted as the rationale for the establishment and operation of a Canadian network. Canadian special educators would welcome such a network, particularly in view of the rapid growth of special education and the increasing demands being made on teachers in special classes. Hopefully, teachers in regular classrooms would also make good use of these specialized services.

In spite of apparent organizational and procedural similarities, Canadian education, and that includes special education, is not American education and Canadian needs in education do not completely parallel American needs. National and regional necessities often call for material which will differ from those available through American sources and through presently established Canadian sources. A Canadian SEIMC Network could act as a central agency which would distribute materials available from American, Canadian, and European sources and could act as a possible mechanism through which provinces jointly could encourage the production and distribution of materials in forms not now being produced or not appropriate to Canadian schools. The Network could share among the provinces the evaluation of materials according to Canadian criteria.

The major concern of this paper is the organization of a Special Educational Instructional Materials Centre Network for Canada. However, the establishment of the network faces many problems, several of them unique to Canada.

First is the fact that Canada does not have a federal department of Education to act as a co-ordinating and funding agency. Since the British North America Act gave responsibility for education to the provinces, they have guarded that responsibility jealously. That does not mean co-operation is impossible, but it does mean that 12 independent agencies must be brought to some form of agreement -- 13 if the federal government is to be involved.

A number of possible agencies to provide the needed initiative and
nation-wide connections come to mind:

The Canadian Teachers' Federation,

Canadian Education Association, and the

Canadian Association of School Administrators.

However, they are not equipped to handle so widespread and involved a project covering such a small area in their spectrum of interests. The Council for Exceptional Children is intimately involved in special education but the Canadian Committee which directs the CEC Canadian activities has neither the personnel nor the financial wherewithal, regardless of its intense interest in the area.

The Council of Ministers of Education would seem the best organization to promote the establishment of a network. The Council could make the funding possible and could arrange for the necessary country-wide co-operation. It could, through the individual Ministers of Education, provide the necessary legislative power for the formation and operation of the network. The Council could provide or provide for a co-ordinator to establish the framework for the network. It must be stressed that the Council consists of politically elected members and that the membership is liable to alteration at any time, unlike the permanent Department of Health, Education, and Welfare in the United States Federal Government. Membership in the Council of Ministers is on a voluntary basis so that withdrawal of one or Ministers, as could conceivably happen, would immediately jeopardize the network in one or more areas in Canada.

An additional problem is that the Northwest Territories and the Yukon are not represented, to my knowledge.

In spite of all the difficulties that I have noted, the Council of Ministers remains as the most logical agent for establishing a country-wide network of special educational instructional materials centres

A second problem to consider is that of the large geographic area with a relatively small population which every Canadian makes frequent reference to and which is a valid problem. My theoretical model calls for four primary special educational instructional materials centres which would, obviously, not begin to cover the whole country effectively. As a second line of distribution closer to the special education teacher, I am suggesting the development of associate centres -- most of which exist now as instructional materials centres and which would require only an increased development in the special education field. The use of mobile vans as travelling centres and of field consultant services, both emanating from the primary SERVICe and in some cases from the associate centres, would extend coverage effectively as done already in the United States.

The suggested locations of the centres and the associate centres are made with the mailing and transportation services kept in mind, as well as paying heed to the population distribution.

A third problem which stems from the political and geographic make up of Canada is that each of the SIXTEN covers several provinces and the independent provincial curricula and the increasing local curricula freedom in each province present quite a hodge-podge of educational requirements. On the other hand, the centres are more interested in the actual technical materials for teaching rather than stressing curriculum development. The American network has not found varying curricula to be much trouble.

A fourth problem is one unique to Canada. Bilingualism has been a reality in Canada since 1760 and is now on a very solid legal basis almost everywhere in the country. The use of French as a language of instruction is increasing across Canada. Provinces which at one time had a unilingual education system are now faced with the necessity of providing adequate material in the French language. It can be expected that special education needs will be included in these requirements.

Most instructional materials centres already in existence carry materials for teaching the French language. But the new developments will force the need for special educational instructional materials in French as the language of instruction. This implies a bilingual network and my theoretical model makes provision for both an English speaking and French speaking section. While this may seem an additional

and possibly unnecessary expense to the American observer, and an expensive luxury to the English speaking Canadian educator, it is a legal and actual necessity. The French language ERC Centre and associate centres would be actively engaged in producing materials to suit the needs of French speaking students and in adapting English language materials into a form suitable for French speaking children. For example, dubbing of English language films into French may not necessarily make that film suitable for instruction in a French language setting. Conversely, the English language ERCs would be performing the same function in adapting French language materials into forms suitable for English speaking Canadian children. This opens the field of French language materials from Europe to the Canadian child of both English and French speaking background. It would seem to me that this kind of international pool from which the Canadian network could draw would be a very strong argument in support of the formation of a specifically Canadian network.

A fifth problem in the development of a Canadian network stems from the much looser organization that exists in comparison to the American network. The relative independence of each province and of each ERIC may make it more difficult for each centre, whether a primary centre or an associate, to agree to emphasize one specialty. It should be noted that certain ERCs already in existence across Canada are beginning to devote their attention to one or two specialty fields.

It may well be that the special education centres will find themselves falling into the same general pattern of stressing those areas which they have the resources to deal with and/or which they find developing by necessity. It is to be hoped that the initial planning of the Canadian network would include some attempt to indicate the areas of stress which each SECEC and associate centre would have. I made reference earlier to the geographic versus population problem that is a particular Canadian obsession. Using the pattern of the United States as a base, Canada should have one and one-half special education instructional materials centres. Instead, I am suggesting four -- one to serve French speaking Canada and three for English speaking Canada. The associate centres are distributed so that each province or territory is served by at least one centre and so that there is a reasonable geographic distribution.

Each centre, whether primary or associate, needs to contain sufficient depth of materials to justify this development and its maintenance. This is particularly difficult since each centre would be covering a smaller population than most comparable American centres. No central funding can be expected and so the financial resources available to each centre will depend on whether they are located in a Provincial Department of Education, a University, or a School System. Funding for each centre will depend on the priority given to it by the individual funding agency and on the amount of money which the agency can make available.

Some of the problems that I have listed are valid arguments for skeptics attempts to establish the network. I feel that the arguments in favour of a network far outweigh the difficulties that would be encountered in attempting to establish and maintain such a network.

A rudimentary and very unorganized SECTE network now functions -- it is not accurate to say one really exists -- in a highly individual and unorganized fashion for materials for visually impaired students across Canada. Some provinces do have a centre of excellence to disseminate large type and sometimes braille books to students in school systems. Any formalized structure would increase the efficiency, and the effectiveness of the service one hundred fold. Such increased effectiveness could be expected in other special education areas as well.

Having enabled the Council of Ministers with the responsibility for making legal initiation and financial support of the network, I am going to suggest the following structure.

The French language section of the network would be based on a primary centre at Montreal with associate centres at Sherbrooke, Quebec, Moncton, Ottawa, and St. Boniface.

The English language section of the Canadian network would have a primary centre at Halifax with associate centres at St. John's, Fredericton, and Charlottetown. The primary centre at Toronto would have associate centres at Montreal, Ottawa, Thunder Bay, London, Hamilton, and Windsor. The primary centre located at Edmonton would have associate centres at

Vancouver, Edmonton, Calgary, Saskatoon, Winnipeg, Regina, and Winnipeg.

The Council of Ministers could appoint a co-ordinator of the Canadian network who could have his office either at the primary centre in Toronto or at the associate centre in Ottawa. If the Council of Ministers is reluctant to provide this person, it may be that actual co-ordination and co-operation would be on a voluntary basis by the individual directors of the centres. The second alternative is less desirable, and would weaken the value of the network considerably.

I cannot see the advantage in setting a Canadian duplication of the American Educational Resources Information Centre operated by the Bureau of Research of the United States office of Education. I would recommend that each of the primary centres at Halifax, Montreal, Toronto, and Edmonton should have direct communication with the ERIC network and that each of the associate centres have access to the ERIC network through the primary centres.

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PRE-SCHOOL TRAINING FOR THE NURSERY AGE RETARDED CHILD

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While I propose here to speak about Pre-School Training for the Retarded nursery age child, let me include this in a broader definition. Day care of children refers to the wide variety of arrangements which parents, for various reasons, choose for the care of their children, of whatever age, during the day. This concept includes such facilities as family day care or child development centers, nursery schools, day nurseries, kindergarten programs planned for hours before and after school and on days when school is not in session--regardless of the name, purpose or auspices. Good day care provides educational experiences and guidance, health services and social services as needed by the child and family. It safeguards children, helps parents to maintain the values of family life, prevents family breakdown.

There have been periods in our history when national focus was placed on the care of children in good programs. The war years saw this with the passage of the Lanham Act--when it was necessary for women to be in the labor market.

In 1962 the United States Children's Bureau was given authorization to spur on the development of day care programs. The goals were simply stated as follows:

(1) Establish more public day care centers, making full use of health, education and welfare agencies in state and local communities.

(2) Stimulate increased cooperation with voluntary agencies so that all well-qualified resources may be used for needed day care of children. Many voluntary agencies stand ready to modify their programs to obviate full-time placement of children away from home and to meet the tremendous needs for more flexible child care arrangements.

(3) Help states make effective use of the important tools of licensing and consultation to improve the quantity and quality of care in these centers.

(4) Help develop and maintain the standards for meeting needs of groups--of three to seven year olds in creative group or foster family day care, and the neglected group of older youngsters in protective opportunities that offer enriched experiences.

The passage of the Economic Opportunities Act has given added current impetus to an accelerated move toward development of early childhood education and care programs and recalls to us the statement of the "Educational Policies Commission" made in 1962--and I quote:

> "Public nursery schools and kindergartens are particularly useful in deprived communities. They can go far in providing the experiences that contribute to educability and care otherwise lacking in the lives of many disadvantaged children. For example, it is not uncommon for disadvantaged children, if they come from illiterate or semiliterate homes, to reach school age without learning that reading is, no adult has ever read anything to them. The difficulty of teaching them to read is manifest. Kindergartens or nursery schools can provide a significant service to such children, merely by having an adult read to them from books they can understand. Such experiences can raise the level of children's aspirations before it is firmly set and can promote learning readiness before setbacks convince them that they cannot learn."

Supporting this statement is an experimental project in New York City which, according to its Director, Dr. Martin Deutsch, is the first scientific and concerted attempt by a public school system to confront the problem of educating poor pre-school children. The program, which has 96 children enrolled in 6 public schools, is taught by public school teachers retrained to work with deprived children at this age level. It is based on the premise that intelligence is a dynamic process which can be stunted or stimulated by experiences, and that the early childhood years are particularly important in the development of intellectual functioning. An evaluation of this project following one year of operation shows that children in the program last year are scoring far higher achievement tests than slum children outside the program.

It was from this vast group of children in deprived communities that heretofore large percentages, at school age, were assessed as mentally retarded. Researchers now tell us that this early childhood education can be a major preventive to mental retardation.

The achievement of adequacy is, after all, the major task of development. But one of the most frequent and most stereotyped misconceptions which school people have is the notion that learning begins at five and for the retarded at eight.

Now, we, who have had more than passive confidence in pre-school education, feel that this is untrue. We know that such basic learning begins at the nursery school level--even though a great many still tend to rely on nursery education to provide only the setting for good adjustment, for the working out of emotional problems, for the supplying of food for mental health--to ready the child, as it were, emotionally and physically for the task of learning.

One of the most dramatic conclusions arrived at in the search for programs which compensate for deprivations (the effects of which show up in the early years of formal schooling) is that the most important steps in cognitive development take place in the years that precede kindergarten. Although there are implications in these studies from which we can generalize, it is with the effect of experience on learning that we are concerned. From such classic studies as these, long ago, of Maria Montessori with the acutely deprived, and more recently of Dr. Martin Deutsch, we learn that the omission of experiences, motor, sensory, cognitive, emotional, physical, social, concrete as well as abstract, verbal and non-verbal, is just as detrimental to growth as malnourishment, and lack of love. Growth is not divisible. In all parts of him the child is responding to his total environment. Any denial will cause him to accomodate, to bend and distort his "self" for the sake of survival.

It would seem a good idea to base a program of activities for the seriously disadvantaged, inexperienced young child on the provision of all those experiences which he needs in order to cope with the tasks of learning: experiences which expand his world, which give him the opportunities for solving problems, which help him to become familiar with the cultural symbols in his environment-- words, sounds, shapes, textures, colors, common social interchange--use of the telephone, going to the store, etc. As he builds his resources of experience, he will have confidence in his own ability to communicate and to understand the language of the educational system in which he is being taught. He will be able to test the function and relationship of ideas. He will learn.

We are constantly attempting to define the body of experiences necessary to bring each child to his starting line. We are constantly reminded that even at their starting lines, children in our ever complicating culture need certain minimum strengths, experiences and preparation to complete their tasks of development.

It is important to realize, as we try to create a program for these children, that they have special strengths, from which we can learn, and that we must approach them aware of, not disregarding their differences.

What are the ingredients of a good pre-school program for the mentally retarded? At a recent National Consultation on Group Day Care for the Retarded, convened by the National Association for Retarded Children, Dr. Leo Cytryn, Psychiatrist at Children's Hospital in Washington, D.C., defined the four categories to be included as: Care, Prevention, Enrichment and Repair. See how these fit as I elaborate from material presented by the Child Welfare League of America in its Standards on Day Care:

The activities and experiences which a child is able to have through his relationship with the teacher and other children in a group should be planned, in accordance with his needs, so that

(1) he develops a sense of his own identity and personal worth, responsibility and self-control

(2) his physical development is promoted

(3) he can begin to move out of the family unit, and to trust other adults besides his parents and family members

(4) he integrates his experiences within and outside his home

(5) he can be part of a group

(6) he can select behavior appropriate to different expectations and circumstances

(7) he learns to cope with real life situations

(8) he acquires and can use knowledge and skills

The program should allow for individualization in accordance with each child's developmental level, capacities, special needs or problems, and experiences at home and in his neighborhood. His particular needs should determine what is expected of each child, the choice of activities or of stories, and his relationships with other children and the teacher.

The program should have continuity and flexibility, and be related to the progressive developmental requirements of the children.

Regularity in day-to-day routines gives children a sense of stability and continuity, and prepares them for what happens next.

Some children get along best with relative freedom, and some require structure and organization.

The child needs to be independent and self-sufficient, and at the same time, even when he is older, needs to be dependent. He should have opportunity to do things for himself and to make his own decisions within feasible limits; and at other times, to have help with things he is ordinarily able to do, and to have decisions made for him.

There should be opportunities to develop the sense of mastery and competence which comes from responding to the challenge of real tasks.

The routines associated with physical care have great learning value which the teacher of the young child should utilize. The child develops a core of independence and self-respect as he learns to take responsibility for his physical needs.

Children should be able to run and use large equipment to exercise large muscles and to "let off steam" so that their activities indoors can be more relaxed.

The child's security depends upon the familiarity of his environment, his relationship to a friendly, understanding adult, and consistent handling throughout his day. Insofar as possible, each child should have a particular adult, usually the teacher, to whom he can feel close, and who helps him, when he needs it, with care of his bodily needs. The younger the child, the greater his need for a warm, protective and supportive relationship, particularly when he is away from his mother for long hours. It is important that he should not be shifted from room to room, that his group be small, and that he have a relationship with as few teachers as possible.

The experiences of the child in the family group from which he comes and to which he returns daily are an important part of his life and should be related to his experiences in the day care group. Children and parents have strong feelings about separation from each other. The child must feel that his parents, and their standards and values which may be in conflict with those of the day care center, are respected.

In considering pluses which might be added to these goals for the mentally retarded, such variables as age, level of functioning, emotional status and associated disabilities were seen as significantly related factors by the group. Chronicity was also mentioned as a plus factor. This discussion lead to stressing the importance of assessment of children who seemingly may be candidates for day care.

Family day care, homemaker service and social services received special emphasis as essential parts of program. Also staff development's place was recognized.

Add to this educational enrichment, the health (and I use this broadly to include dental care, psychology, speech and hearing, vision, physical therapy, nursing care) as well as the welfare services. The first will help to obtain good diagnostic evaluations on each child and at the same time supplement and assist in the parents' efforts to provide good health services. This can be done by taking advantage of existing community health services for the needs of the individual child and to insure the health standards of the personnel of the agency.

The entire staff, and particularly the social work or welfare component needs to be aware that day care services for retarded assist parents to live a more normal life and care more adequately for the retarded child as well as other children in the home.

In some cases, institutional placement can be avoided if Day Care alternatives are available.

Day Care Services strengthen school services by preparing retarded pre-schoolers for special classes.

Retarded children excluded from school need social experience and training.

When a child is deemed "not ready for" or "not able to profit from a school situation", even though the judgment may be accurate, he is automatically returned to his parents for more time "to grow in." The chief difficulty here is that, without some outside help, the growth may not take place at the rate of the child's potential, however limited this may be.

Where the child has not had opportunities for play, being with other children brings forth mastery in certain developmental areas which previously have not been achieved. (Walking, talking, throwing, picking up things, chewing, swallowing, carrying objects, etc.)

Since the parents observe the child being influenced in his development through interaction with other children, they are able to relax about placing pressure on him, and they are reassured that according to his own pace and potential, the child will master certain functions. It gives them a more objective view of the child as they compare him with others.

It is a considerable relief to the mother to have certain scheduled hours away from the child; this refreshes and renews her strength to deal with the child's demands for attention and care.

The Day Care facility gives mother and child an opportunity to deal with separation anxieties; the child is able to transfer his attention from his mother to other adults and children; and the mother is able to experience that the child can separate from her.

The parents sense keenly the child's loneliness and his need for peer relationships; the center begins to meet these inherent natural needs of the child--and thus, it is of benefit to the entire family.

The social work personnel can be most effective in offering assistance and developing cooperation between the parents and the pre-school center. This relationship must include:

(1) Help to interpret the program of the pre-school in terms of the child's development.

(2) Help to extend the learning experiences for the child into the home--which is, after all, the most important setting for the young child.

(3) Assistance in planning for the child's future which requires realistic setting of goals, use of existing resources as well as involvement with others(LWC chapters, etc.) in working for establishment of new services.

(4) Help to a greater understanding of what exactly is mental retardation and how to interpret this to family members, including normal siblings, friends and relatives.

For the primary objective of a day care program is to strengthen family life by helping parents meet their children's needs. Through service to their children in the day care center, we not only enable them to function more adequately as parents during periods of stress, but we also provide protection for the children and a constructive living experience for them while they are in the center. It is a family-centered service with the daily program for the child as the focal point around which health, educational, and social services are integrated.

The nature of the service itself, the practical day to day contact with parents, encourages the development of constructive relationships with them while giving their children rich social and educational experience in the center program.

Frequently very significant results have been achieved by day care center staff in changing parental attitudes simply through the kind of acceptance, respect, and understanding they have shown to harassed parents. One of the major objectives of the day care program is to give the parent a feeling of worth as a parent and as a person in his own right. Many parents who come to us seeking service are overwhelmed by their problems and suffer from a sense of personal failure. Day care helps them to regain confidence in themselves.

We must also remember that parents can be a reservoir for volunteer help in the school and around the school--as well as in the extension of additional services for after pre-school and on and on.

I go on to list some of the ancillary services which could be helpful. However, I shall not dwell on these since we can give some time to their discussion this afternoon. I refer to but two--homemaker services and short time residential care--so parents can take a vacation, which might be difficult with the severely retarded or multiply-handicapped youngster.

I propose now to talk about some actual programs, citing a few of the States which are under way, some for many years.

Delaware, Maryland are among the old timers, with state appropriations either totally supporting or supplementing local efforts. California has pre-school day care programs available for all children, some integrating the retarded with the normal. Recently their legislature made permanent and urged expansion of what was originally a pilot program for severely retarded and physically handicapped. Connecticut is building a variety of regional centers, which will include residential facilities, day care, pre-school, job training, and diagnosis--all supported with some federal demonstration and grant money. Minnesota has had state appropriations to subsidize centers on a matching basis with responsibility for administration placed in the hands of the Department of Public Welfare. As of February 1, 1966, they had 40 state supported centers, 7 others without state support, and interest in 23 other areas for new centers.

Kansas enacted legislation in 1965 which states:

> The purpose of this act shall be to aid in development, maintenance, improvement or expansion of day care programs for the mentally retarded and other handicapped children in this state.
>
> The state board of social welfare hereinafter referred to as board is hereby designated at the official agency of this state authorized to accept and disburse funds made available to the said board for grants-in-aid to eligible local community organizations for day care programs for mentally retarded or other handicapped children. The said board is authorized to accept any moneys made available to the state by the federal government or any agency thereof and to accept and account for state appropriations, gifts and donations from any other sources.
>
> Grants-in-aid under the provisions of this act shall only supplement local funds, shall not exceed one-half of the cost of operating expenses of day care centers for retarded or other handicapped children and shall not be used for the purchase or construction of buildings.
>
> Day care programsshall be those which provide day service for development in self-help, social, recreational, and work skills for mentally retarded and other handicapped persons, giving priority to providing services for the severely and young retarded or handicapped.

As of 1964, they had 19 such centers. There are more now. And here in Washington, I am aware of the Upton Act which gave state moneys to existing programs which served the young retardates, pending their entrance into residential programs. Now I note from a current issue of 'Hope' that in the new Olympia Center, at Bremerton, among the services to be provided will be:

(1) Expansion of the present Forest Ridge Day Care Center serving the less severely retarded children;

(2) A second day care center to care for severely and profoundly retarded children.

I have seen some of these programs. I, myself, work in one--a large agency operated pre-school for normal and handicapped children. I would like to describe, in an overall fashion, what we do and what I saw in a small public pre-school for moderately and severely retarded in Holland. Let me start you in Europe.

The room housed ten children with one teacher and an aide. It had little equipment since there had been a minimal budget from the local school district. I saw a teacher fully aware that learning takes place through a total human being--through motor experiences, through touch, taste, smell, through audition--hearing and speaking, through vision. And all of this requires respect of the human being, the confidence in that specific child which helps to reinforce his developmental tasks of learning to live with a variety of tools--starting with his own body, of learning to live with people and also learning to live with self.

Out of stripe of old newspaper pasted to the floor, this teacher stimulated and encouraged the use of this walking board, of those crawling and rolling lanes. With old blankets taped or sewn together, she improvised tumbling mats; with blankets or sheets thrown across tables, she had tunnels; with blocks up to the top of a table, she had stairs and heights. Rhythm instruments were bells, bottle caps, tin cans empty or filled with dirt, boxes with pebbles in them. Scraps of cloth, paper cardboard, pebbles, leaves, flowers, shells, feathers--everything was hoarded and put to use. A large wash tub contained water with floating and sinking objects. Clay was play dough of salt, flour and water. I read some of the records on children and discussed them with the staff. Hans, aged six, who had no sense of direction in the use of his body--and I don't mean East or West, North or South--could now be sent to the next room on an errand and return, errand accomplished; he could now find the bathroom himself, take care of his needs and remain dry. Greta, aged five, who could not focus on a picture, a person, or any object, and who bobbed up and down constantly, now pulled me to the table to point out pictures in a book.

And what happens with us? Yes, we have a larger budget which allows us to purchase many learning tools. However, much of our equipment as well as many of the different ways in which we use equipment has come from careful observation of the children and their development. Let me give you an example. The custom for years in nursery schools and kindergartens was to supply small scissors to children--those in which you can only put one finger and one thumb into each hole. We noted the difficulty of the young retardate, whose small muscle and motor development was slower, in making use of such scissors. We turned to large scissors which have one hole into which two fingers can go, giving extra leverage. Result--everyone learns to cut more quickly and with greater ease. Sure, we blunt the edges.

Our staff of teachers and aides is supplemented by a large group of volunteers and college field work students whom we train before and on the job. This allows us to work intensively with individuals and small groups of children.

Let us look at Mike--referred by the public school kindergarten--at almost six years of age, right in body use, almost hysterically frightened of new experiences, lacking adequate speed, allergic for no social interchange with children or strange adults--borderline moderate to mild retardation. One staff member worked with him almost every day for one half hour concentrating on motor movements, crawling, rolling, bouncing him in a prone position on the trampoline, progressing to walking, changing directions periodically, to crawling toward a target, retrieving and returning with target in a different motor fashion. You may ask why we did these and other motor activities with Mike--so he could get a total body understanding of extension and direction.

It was translated into other things--block building, not just up but sideways, frontways and backwards to building with our entire body, to painting on a whole sheet of paper and not just in the middle, and finally to verbal comprehension which originally were requested words labelling an activity or direction. We began to note inflection in Mike's speaking and an increase in expressive vocabulary. At the same time, we spent a good deal of time with Mike's parents, helping them to set more realistic goals and to add to their repertoires of child rearing.

I could go on to others. For each child there was individualization of program. Speech therapy may have been major for one; role playing in the housekeeping corner for another; sensory stimulation for yet another. Throughout it all, we are aware that each young child needs one central person, available exclusively to him at regular intervals and particularly in times of change or stress.

You will note that we used some of the new teaching methods developed by Dr. Ray H. Barsch, Psychologist at the University of Wisconsin, Dr. G.T. Getman, optometrist from Lumsure, Minnesota, whose book, by the way, with a peculiar title, is excellent--"How To Improve Your Child's Intelligence". We've also learned from the psychologists working with operant conditioning. The area of early childhood education and care must reach out into all fields of research into learning. We warn again, however, in the words of Dr. Leo Cytryn, whom I quoted earlier, that "these methods should not be allowed to convert the teaching process into a mechanistic, impersonal operation. A continuing stress on teacher--child relationship in an atmosphere of trust, acceptance, respect and warmth is essential, regardless of the teaching methods employed."

There are now a variety of federal funds--for demonstration projects, for comprehensive programs and for purchase of child care, all of which should include programs of early childhood education. At the same time, we must look to our own state departments--health, welfare and education, linking hands with the local communities and voluntary agencies for a meshing of strength, staffs and funds to make these services a reality in the local communities.

Who starts it--we know that parents originally stimulated the developments. However, back a long time ago, Dr. Montessori stimulated some very wonderful programs and recently Dr. Deutsch.

It needs us all: we can make requests for help to community action programs, to colleges, to committees on early childhood education--which now exist under the authorization of state departments of education, the inter-agency committees, now functioning to implement the 89 Comprehensive Planning. It makes no difference who starts the project moving. Whoever moves can invite the participation of others.

HELPING THE RETARDED OR MULTI-HANDICAPPED PRE-SCHOOL CHILD WRITE HIS OWN EDUCATIONAL PRESCRIPTION

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Quite often during the course of a school year, the teacher of handicapped children will discover a problem area in the education of one of her children which has no ready answer, with no ready-made curriculum materials or information commercially available. If the teacher is perceptive and responsive to the needs of her students, this situation will probably be the rule rather than the exception. Most educational prescriptions, to be the most effective one available for a child, must be specifically tailored to the individual child, and are not usually found pre-packaged. There are some attempts now being made to organize curriculum materials by handicapping condition or specific problem area, such as the Diatha Kmaan Kaydan System. But even if such a system is available, the materials recommended are still not specific enough and must consequently be adapted to the needs of the individual child. For the most part, the more cognizant a teacher is of the needs and limitations of her students, the better she will be at preparing programs for them. What this means is that a teacher will usually have to develop her program right in the classroom, adapting materials to the needs of her children. Materials developed for the trainable child are limited, and they do not usually make allowances or provisions for any additional handicapping conditions. The possibility of individual variations in abilities is tremendous, as are the possibilities of various combinations of handicapping conditions. These two factors, multiplied together, give an almost infinite number of variations possible in the way a teacher will approach the process of teaching

a child some skill. A teacher will begin to feel that to be most effective, it is necessary to know all about physical therapy, medicine, psychology, social work, speech therapy, and many other skills. While this is not usually possible, resource people can be consulted for necessary information. Even then, the teacher must usually outline the problem area and implement the suggestions offered, on a daily basis. The problems are the same, whether adapting information to specific children or developing your own programs:

1. What is the problem?
2. What is the goal?
3. What are the obstacles to the attainment of the goal?
4. How can the goal be analyzed and sequenced for teaching?
5. How can the teacher assess the effectiveness of the program?

What is the problem?

In a pre-school situation for retarded or handicapped children, the problem can be almost anything, in almost any proportions, from a lack of toilet training behavior, to a severe emotional or behavior problem, to a lack of almost any (or all) behaviors. Some assessment instruments, such as those used in the Portland pre-school test year (Teaching Research Infant Development Scale, Peabody Language Kenpis, and an adaptation of the Gunsberg Progress Assessment Chart) are designed not only for the purpose of outlining areas of deficiency, but provide a listing of behaviors, usually in a developmental progression that a teacher can teach. For these reasons, it is felt that these checklist assessment instruments are far superior to the standard I.Q. tests, if for no other reason than the results obtained through them are useful. An I.Q. score will tell a teacher that a child lacks the "normal" compliment of behaviors associated with children his age. What it does not do is provide any basis to change that decision. The I.Q. test is also sometimes abused to classify

a child. A child with high I.Q. scores is placed in college preparatory courses, the low-scoring child is placed in vocational classes and the child who,because of some deficiency in language or ability, scores below 30 or so, is recommended for institutionalization. What results is a perverse situation wherein the child most in need of education, receives the least, and the child who has the easiest time learning, receives the highest quality education. The developmental checklist is useful for the purpose of teaching.

What is the Goal?

The goal of most education of handicapped or retarded children of pre-school age is usually to make them function as independently as possible, to make them function as nearly like "normal" children as possible, or to develop the child's potential as much as possible. Within this general sort of goal are some more specific goal areas such as; developing or accelerating behaviors in the areas of self-help, motor development, or language. It must be understood that goals are goals of the teacher, or the parent, and not necessarily the child. When the child receives an intervention program such as a pre-school, the behaviors that he has at that time, and which are expected, are satisfying to him. A child screams, or throws food, or cries quietly, or keeps his head, or helps his mother, because he has learned these activities and he has learned and received these behaviors because they were somehow satisfying to him. A teacher should assume, then, that what a child does, he likes to do. If a child cries in a corner pulling his hair, he is usually satisfied, and any goal that she may have for him will be an exercise one. It is the teacher's job to take the desired terminal behavior, and introduce it in such a manner as to make compliance with the teacher's wishes, (and consequent toward the goal) more satisfying than existing in the corner pulling his hair.

Objectives at the Goal

It is assumed that every child in such a pre-school as has been described, because, or has learned, more slowly than the majority of children his age. Some of the reasons for this may be obvious, such as deafness, blindness, emotional disorders, etc. Some of the reasons may not be known, even by qualified physicians, neurologists and the like. What is important, is that every child has some impediment, or impediments, to his ability to learn rapidly, and as a "normal" rate. These impediments must be considered, and any program that is written for a child, must be written around these impediments. For a blind child, the teacher may rely primarily on verbal presentations and responses. A deaf child may require more tactile and visual stimuli, and any program that a severely physically handicapped child, such as a cerebral palsy child, works on must be built around the impediment of restricted physical control and movement.

For children whose limiting condition is unknown, as well as for those children who have some combination of handicapping conditions, the objectives are also available. The presentation must be organized, an analysis of the goal or desired terminal behavior must be undergone, and the component parts of that goal taught slowly, completely, and in some sequence which will facilitate the accumulation of component parts into a unified task. (See examples, Fig. 1 and 2)

Analyzing and Sequencing a Task

Most goals or tasks can be broken into their component parts or successive "points" which are readily detectable. A picture puzzle, for instance, is composed of pieces. In order to teach a child to "become better coordinated" perhaps one of the goals would be: "Teach Johnny how to put together a puzzle." If the teacher were to take all the pieces out, pull them apart and say, "Now, Johnny, put the puzzle together", Johnny would probably walk

away, or throw everything on the floor, or just sit there. Analyzing her failure to teach him to put the puzzle together, the teacher might try again with another approach. Sitting Johnny down in front of the disassembled puzzle, the teacher might say: "Johnny, I'll help you put the puzzle together" and begin assembling the puzzle. Once it was done, she could say: "Okay, Johnny, now you do it." Johnny might try a piece, throw it away and just sit there. Nobody likes to fail, especially someone who has failed again and again. It is important at this point that the teacher still believe it is her failure to teach that is causing Johnny's failure to learn. If not, she might begin thinking that Johnny was too slow to learn to put together the puzzle, and decide to try teaching something to someone else. Perhaps the quality which is of paramount importance in a teacher, is that she believe that children, no matter how handicapped or afflicted, are able to learn if the teacher has the proper method and approach. Handicapped children are usually so used to failure that they are not liable to be overjoyed with the opportunity to fail again. Usually, an opportunity to be successful will prove immensely satisfying and may be more reinforcing than any reinforcement offered by the teacher.

It has become apparent to the teacher, at this time, that Johnny is not responding to her methods. If she is persistent, and is still convinced that it is her presentation that needs development and it is not Johnny's fault, perhaps she will try many repetitions of "showing him how to do it", perhaps with some success. Finally, she may hit upon "reverse-chaining" the pieces of the puzzle, which enables the teacher to help the child learn the pieces, and put them back into the puzzle as a whole, in a systematic manner. She could first put all the pieces together, in a frame. She could then take out one piece, show Johnny how to put it in several times, then let him try it. If he was successful, she could give him lots of praise, pick up the completed puzzle and show it to several other people, etc. Next she could take out two pieces, the piece he had previously learned, and one new piece. She would show him how to put in the

pieces, but can say it, then have him replace it and the piece be lowered
before. New pieces are introduced as he learns, the rate determined by his
ability to learn. We always reinforce his reinforcement at the same piece,
the end of the puzzle. We want to show people how good he is at putting pieces in,
just as soon as he learns a new piece, and he is proud of what he can do. We
learn faster than with any other method the teacher has tried. We think of
himself as a success at some things. This is an example of a method which
can be extremely successful if a teacher incorporates it into a sequence.

Some learning tasks do not have such convenient "pieces" to use in dividing
a task into component parts. What parts are there to dressing, for instance?
Any action, such as pulling on a shirt, or pulling on a pair of pants, can be
broken into artificial "parts" which can be taught individually. Pulling up
pants, for instance, can be broken into as many parts as are needed on the basis
of:

1. Child cap
2. Step one leg in
3. Step other leg in
4. Pull $\frac{1}{4}$ way up
5. Pull $\frac{1}{2}$ way up
6. Pull $\frac{3}{4}$ way up
7. Pull all way up
8. Zip down
9. Snap top

The basis of this analysis is first, separate movements,* and secondly,
percentage of the total movement. Once the movements themselves are identified,
they can be broken into as many portions of the total as is necessary to allow
the child time and understanding and experience enough to allow success. The
teacher must always "take him one from the child". Since zipping and snapping
are separate operations, somewhat more difficult than the pulling up operation,
they can be taught at a later time. In teaching the pulling up, one would
teach from the end of the movement to the first, such as step 7, step 6,

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* Movements as is used here does not refer to the separatable movement cycle,
but to a single movement from one position to another.

step #3, steps #4, #5, #6, etc., reinforcing after the pause was pulled completely up each time. Once he learns an operation (such as pulling his pants from 3/4 up to completely up) he uses that operation again and again, only adding to it each time. The repetition is not monotonous, it always varies, becoming closer and closer to the desired terminal behavior.

Many behaviors which the child does not have in his repertoire at all can be taught by reinforcing successively better approximations of the goal. A child who does not speak, for instance, has no speech which can be reinforced. What he does have, however, is crying, whining, laughing, or something which remotely resembles speech. This can be shaped, by requiring better and better approximations of speech sounds. Behaviors which are inappropriate can be either made appropriate or decelerated in several ways. A child who shakes hands continually can have his handshaking behavior made appropriate by reinforcing it when it is appropriate, and ignoring it when it is inappropriate. A child who has temper tantrums can have that activity decelerated by ignoring it when it occurs, and reinforcing some behavior that is mutually exclusive, with regards to tantrums, such as reinforcing "not having temper tantrums". This can be done by reinforcing the child every time he goes for five minutes without a temper tantrum, twice every ten minutes, and so forth. "Teach the child to like out of being good."

The task, then, must be analyzed, broken into its component parts, each part taught, the parts put back into their respective places. The goals which may be subjected to this analysis are of several types. The first of these types is inappropriate behavior (i.e. hand shaking at all times), the second is behavior which the child lacks,(like reading, etc.), the third is behavior which must be decelerated because of its undesirable nature (hand banging).

Assessment of Program Effectiveness

In order to provide the necessary sorts of data to properly assess and alter an individual prescription, it is felt that a precision teaching situation is mandatory. The teacher who has just finished developing a new prescription cannot be certain of just how much of an effect it will have, what necessary steps may have been left out, or any number of unpredictable variables. After the program has been formulated it must be tried, and the resulting change, if any, must be charted for easy reference. Alterations can include such things as a redistribution schedule, a shorter breakdown of the task, an elimination of unnecessary steps in the analysis, or further contingencies that alter the performance of the child in some way. Counting behaviors before, during, and after an intervention program is usually enough to tell whether or not it is producing change in the desired direction, but the rate of change must be considered also and charting is really the only sure way of watching that. In order to make the program most effective, the rate of change should be as rapid as possible. The rate can be watched and the effects of alterations observed as they affect the slope of the graph. Only by including the child's performance into the development of the task, can a teacher be certain that the program is efficient and appropriate. Program alterations will probably be instituted daily, as well as long-range changes which will be necessary as the child reaches criterion level and is ready to move to another phase of the program, or to another program altogether.

In the development and evaluation of an individual educational prescription, the following steps are generally followed:

1. Define a problem and decide on a priority.
2. Developing a theoretical basis for a program, designed to remedy that area of deficiency in a child.

3. Systematize the theoretical basis into a task analysis sequence.
4. Try the program with the child.
5. Check (gather feedback from performance data)
6. Evaluate and interpret feedback
7. Alter original program to conform to feedback
8. Try the program again, check results
9. Assess daily alternations as progress occurs
10. Check long-term progress and prepare for extinction level reminder or another program.
11. Develop the program to adapt it to the various modes of children. Do not discard after one child has finished it. Make it broadly applicable. [illegible]

Examples: Laura's Letter-Writing Program
Amy's Walking Program

[illegible]

Laura's Letter Writing Program

1. Goal - Teach Laura to write his first name in capital letters.
2. Impediment - No previous control drawing experience, only scribbling.
3. Philosophical Approach - It was felt that a child such as Laura could be taught to write his name in capital letters by a reverse chain sequence. Each letter would be reverse chained so as a child would be guided through the manipulations necessary to draw the letter. Once the child would be guided through the steps to draw the letter, only his hand would be released over the end of the letter leaving him to complete it. Each letter in his name would be sequenced in such a way as to provide a reluctance or power inconvenience as when to let go of his hand and what name to give. The child would learn to write the last letter of his name first. The first step in Laura's educational prescription on letter-writing was to write the letter A. The first step in writing the letter A, was to draw the middle leg of the capital letter A from left to right. The cue was to be "Draw your A name".

The second step in teaching Lenore to draw the letter I was to lead him through the letter until the child reached the bottom leg. Then his hand was to be released allowing him to finish the bottom leg and then the middle leg. In this way he was required to complete more and more of the letter associated. His reinforcement, as in all reverse chain sequences, came at the completion of the task. Once he had learned the letter I, the cue changed to "Lenore, draw your ES name". The cues progressed to "Lenore, draw your BOB name", "Draw your ANNE name", "Draw your LARGE name". This cue was finally faded until it became "Lenore, write your name". In this way each letter was reverse chained, the sequence of letters was reverse chained, and the cues were shaped to fit the boy's progress.

6. Feedback from Lenore - Lenore wrote his own program however so he provided the necessary feedback to alter the program, make it most efficient, and adapt it more specifically to himself. The optimal letters in the program had been developed so as to provide the easiest production while maintaining readability. In practice it was found several of these letters were more difficult than needed. For instance, after Lenore had learned to draw his BOB name, and began learning his ANNE name, the A was extremely difficult to teach in that it always became an H. Also, after Lenore learned his C, his G became rounded. Furthermore, when he learned his S, his G took two of the legs.

One of the most important pieces of information received from Lenore, was that the letters became confused once they had been learned. Some system must be devised whereby each letter can be kept distinct from each of the others. This was arranged by having letters which are somewhat alike in production, for instance, H and N, B and R, C and G, each start differently with beginning strokes of each letter starting in a different direction. Other feedback indicated that letters as taught in normal school, are designed so as to hinder facilitate script writing, and may be improved upon as to ease of production. This improvement may be effected without

any decrease in readability.

5. Results - Laura learned to write the five capital letters of his name in only forty minutes of actual teaching time. It was found that this program developed specifically for Laura, was applicable to other children as well. Four other children, some of whom had been unable to learn to write their names using other methods, experienced success very quickly. It was learned that transfer between letters was available and that the sequence as a whole was successful.

Ray's Walking Program

Some very important information can be obtained by a teacher on just how successful her task analysis is, by watching the child's progress on that sequence. It is assumed that if a child fails to learn, the teacher is failing to teach. This means that if a child stops learning (or plateaus) it is not the fault of "abnormal" development, but the direct result of the breakdown in the teacher's task analysis. Therefore, by observing at what point the child's progress slows or stops, the teacher has a very good indication of where her task analysis needs to be broken down further. The teacher relies her cue from the child in order to provide the child a program in which he can experience and continue experiencing success.

1. Goal - Teach Ray to walk independently and without support.
2. Impediments - None (Brought with no physical impairment)
3. Philosophical Approach - It was felt that by accentuating a developmental stage that the child passes through and by structuring these stages into task analysis sequences Ray's development through these stages would be much more rapid than would occur in a random progression.

There were several points at which the task analysis apparently broke down. One of the biggest breakdowns in this sequence occurred between step 8 and step 9, (standing unsupported and first step). It was found that Ray, even though she could stand unsupported for some time, was extremely hesitant to

to take a first step. Since we could assume this to be the fault of the sequence, and not of the child, this was an indication that further breakdown was necessary. Perhaps what was needed was a standing unsupported on both feet, shifting to standing unsupported on one foot so as to enable the child to swing the other foot forward or backward as required.

Another unexpected problem became very apparent when trying Jay with this program. That was the high incidence of crawling and sitting down. This was dealt with as is noted in figure two. Once these problems had been eliminated by further analysis, Jay progressed from sitting to her walker with no movement to walking unsupported in approximately three months time. The program was administered fifteen minutes per day during the time she was present in class. This program proved extremely effective for Jay but may not be applicable to other children who do not walk. One of these, Dianne, had some cerebral palsy involvement. It was found that many parts of the sequence were inapplicable to Dianne. Another sequence is being developed specifically for children like Dianne, who have cerebral palsy involvement. This program will focus on a preliminary weight bearing sequence, before any attempt is made at mobility.

Conclusions

1. It is felt that the involvement of the child in the writing of his own educational sequence prescription is mandatory.
2. The teacher must be receptive to the feedback and interpret it correctly.
3. It is preferable that too many steps be included rather than not enough, so that the program may have a longer applicability.
4. There will always be exceptions among children as to the appropriateness of a well developed program for them. In these instances, the teacher must be willing to adapt or discard a program which may have been developed at great expense of time and effort.

Developing Critical Thinking Through Use of The Guilford Model

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We are all fervent believers in "developing the higher level thinking processes" for all students - even though we rarely stop to spell out just exactly what we mean by the "higher level processes". I am going to try to focus on very specific processes which can be looked at as if they were separate and distinct from other thinking processes...even though it is not easy to separate these when they are operating.

Because I believe the Guilford Structure of Intellect model helps to clarify the more-or-less distinct mental activities, I am going to focus on that today - and I am going to make every effort to convince you teachers of gifted students that this model has merit in helping you to more appropriately develop complex thinking processes in able youngsters. (See Guilford model)

Note that Guilford separates the specific mental abilities into cells within the cube model. Each of the 120 cells is a three-way composite determined by a specific mental operation, a particular kind of content, and a product. Each of these abilities is believed to be distinct from each of the other abilities.

The operations consist of cognition - the awareness or recognition of information

memory - the retention of information

convergent production - using available information to produce a conventionally accepted right or correct answer

divergent production - proceeding from given information to any of a variety of adequate solutions. No single "best" answer.

evaluation - judgments concerning the adequacy, appropriateness, merit or suitability of information against some criterion.

Each of these processes may operate on any one of four different kinds of content. Obviously we cannot think about NOTHING. Guilford believes that these four categories of content cover all the possible kinds of things which, in fact, we do think about. The first of these is figural content - refers to concrete spatial things, or to line diagrams or pictures.

symbolic content - refers to alphabet letters, arithmetical and algebraic symbols, numbers, musical notation, punctuation, etc.

semantic content - refers to information given in the form of words written or spoken

behavioral content - refers to nonverbal behavior - attitudes, intentions, nonverbal actions, etc. (a head-shake, a wink)

Then the action of a given intellectual process upon a particular kind of content can lead to any of the six kinds of products. A product should be thought of as the form the information takes as it is being processed. These products are

Units - this relates to anything of a unitary character - one word, one chair, one number.

Classes - refers to categories of items - all Ukranian chairs, all wooden chairs with cane seats.

Relations involves the connections between things - such as how are certain sequences of numbers related? What two things look alike? Which things make rattling noises? Things may be connected to other things in many diverse ways.

Systems - relates to the dimension of some underlying pattern between things. For example a school system implies a number of people and things which, taken together, constitute an educational enterprise.

Transformations are seen where original material is changed in some way from its original state. For example when you modify original information you may take a thing - let's say an egg - a hard boiled egg - and transform it into an egg salad sandwich - or into a deviled egg, or into an Easter egg. You have modified your original thing into something different than it was. You are using transformations when you take the pieces of a puzzle and put them together to make a picture.

Implications - refers to the ability to foresee consequences, the ability to predict, or the ability to ascertain antecedents. When we ask a student to apply something he has learned to a real-life situation, we are expecting him to imply from one situation to another.

Those of us who deal with gifted students need to be especially concerned with the processes on the Guilford model DIVERGENT PRODUCTION and EVALUATION - and probably need to be somewhat less concerned with cognition, memory, and convergent production. Ordinarily, gifted students need little help in absorbing or

organizing information. They appear to work in an like a system. They want often memorization is with little effort, since it efficiently as they can retrieve it readily at some future time. They are also very able, ordinarily, at coming up with the conventional and accepted correct answers - convergent thinking. They have been practice in being forced or encouraged to produce many possible equally good solutions. We have often direct them to think in open-ended ways. (Ch. 10 will deal with this). And, as neglected as are the divergent thinking processes, the evaluation area which is the key to critical thinking may be even less frequently stimulated. This is regrettable, because it is thought that the evaluation area underlies all the other processes to some degree or other. For example - in cognition we are selective because we evaluate among very wide possibilities and then decide upon that to which we will give our attention. In memory, we certainly are selective - we do not remember everything by any means. How many cars did you pass on your way here today? How many red cards did you pass today? What did you eat for breakfast yesterday? In convergent thinking, we are also using some evaluation. We continually make internal judgments from among the many items of stored information. If I ask you "In what month does Easter fall?" you have to evaluate many items of information before you come up with a correct answer. You have to know, for instance, how the date for Easter is figured. Knowing this, you realize that it will not always fall in the same month - but you will have narrowed it down to either of two months - then by evaluating some other factors, you can come up with the answer for a given year.

The Guilford model provides us with a logical basis for determining a gifted student's particular areas of strength and weakness. This in turn gives us cues as to which kinds of mental tasks he needs more practice in, as well as those in which he already excels. Knowledge of a student's strengths and weaknesses stated in the specifics of the S-I model can be extremely useful in school and vocational guidance. Even more important to teachers is the fact that the model can be your right hand man when it comes to devising appropriate, stimulating, and over-diversified lesson plans. And most of us have to admit that many of our lesson plans do not merit the adjectives of appropriate, stimulating and over-diversified!

Our knowledge about human mental abilities has huge gaps. We do not know, for instance, whether the 120 separate mental abilities are present at birth, whether they develop later through the maturation process out of relatively undifferentiated abilities. We know that individuals differ greatly from one another in their particular profiles of abilities. And we do know that learning and practice experiences can enhance or improve the functioning of an ability - providing we expose the student to specific, carefully planned tasks.

The Guilford model appears formidible at first glance - but, in fact, it is much simpler than it looks. You need no lengthy instructional period before starting to use it to guide you in selecting appropriate learning tasks. And these learning tasks certainly are not startlingly different from the things you do and have done in the past. The model primarily serves to remind you not to forget to use a broad spectrum of thinking abilities in student tasks rather than to get hung up on a few to the complete neglect of many others.

It is easy to learn how to use and interpret the trigram system - a kind of shorthand system for designating the individual cells by a three-letter combination which stands for a particular operation, content, and product. It is easier to just note your lesson plan MEC than to have to write out MEMORY OF SYMBOLIC UNITS. Look at the Guilford model on the sheet you have - and note that the capitalized letter in each word is the symbol for that word. All are the initial letter except in the case of SEMANTIC in the CONTENTS area, and CONVERGENT in the operations area. In each of these two cases, another word began with the same letter, and would have caused some confusion. Secondly, note that in the trigram, the order is always the same - the first letter stands for the operation, the second letter for the kind of content, and the third letter for the product. Thus MEC would stand for Memory of Symbolic Units. EMC would stand for Evaluation of Semantic Classes. This skill is closely related to concept-formation, because you are judging the applicability of class properties of semantic (verbal) information. You are required to order and structure categories of information. To involve students in improving this specific ability, you might set up a task which would involve selecting the best-fitting of a number of possible class names. For example, given this list - bailiwick, antonym, oyster, relative term -- which of these class names is most appropriate? bailiwick, content, fish, pronoun? Note that this task requires evaluation at a number of levels, as you test one possible class name against the group of words being categorized.

The beauty of this method of brain-stretching is that if you occasionally make a planning error - the worst that can happen is that the student uses an adjacent cell or closely related ability to the missed-target one. And as your precision grows in thinking through possible tasks which will require the use of specific abilities, you will be on-target more and more often. Teachers who use the S-I model in planning become say that it takes no more time than the old hit-and-miss way, and that it provides them with endless ideas for adding new dimensions in teaching a given subject.

Earlier I defined the EVALUATION operation as "judgments against some criterion". However, judgments can be more or less precise, depending on the standard. A judgment may, in fact, be a solution to a problem. Or it may be a way of determining what words or how well it works. If the judgment is in the nature of a social or esthetic decision, it may be based on a combination of social awareness or perhaps on personal commitment. Clearly, there are many degrees of judgment. An important aspect of this operation is the ability to see either logical or causal connections. Often, in evaluating, we are required to reason by analogy.

Now, how can we apply some of these diverse aspects of evaluation into a unit we are preparing for a class. Let's assume we are devising plans to study various aspects of environmental contamination in social studies. Most of us begin by thinking of all the usual semantic involvements we customarily use - have the students read, plan to talk about whatever the subject is. But let us suppose we are determined in this unit to broaden the kinds of intellectual content beyond the semantic,

and to see, also, some figural content and some symbolic content.

We might plan several exercises of the evaluation operation, using figural content, by putting up a bulletin board display consisting of unlightened pictures showing scenes of soil erosion, polluted streams with detergent froth, oil slicks and dead fish, smog-obscured buildings, or urban clutter. If we decided to focus specifically on EFC - the Evaluation of Figural Classes - we could ask students to classify the pictures on a basis which we imposed, or we could ask them to name the classes and then to classify each picture appropriately. To use the bulletin board picture display further, we could require the use of a different cell of the Guilford model, EFR - Evaluation of Figural Relations - by asking, "How are these pictures interrelated?" The students would then have to seek evidences of multi-environmental damage such as the wasting of natural resources as related to pollution when oil leaks damage sea life and pollute the shores at the same time wasting huge quantities of a limited natural resource. They might also relate the depletion of resources to soil damage where strip mining is used - and this could be further related to smog because smelting of metal often causes air pollution. Well - you can see there are endless possibilities at different levels of interpretation.

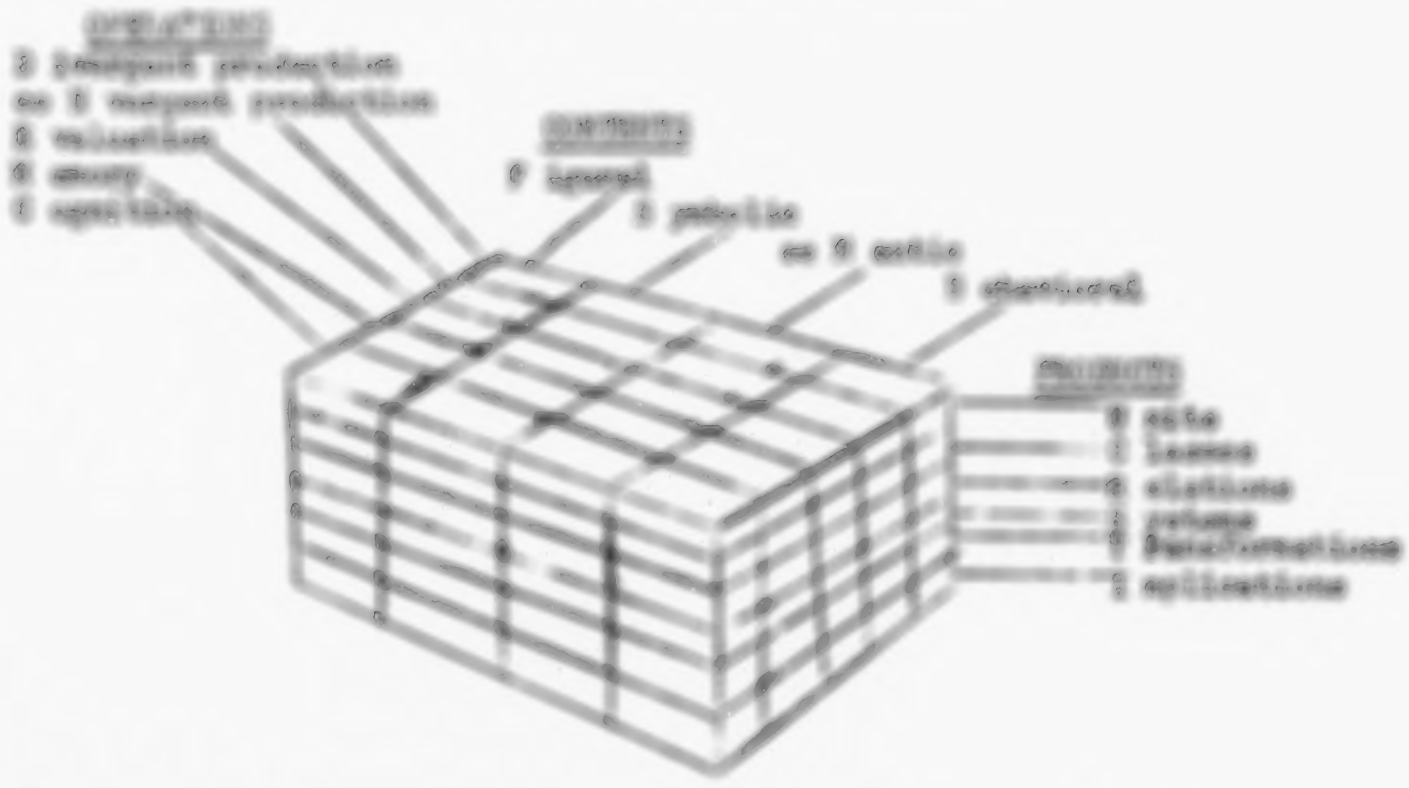
Suppose in our environmental unit, we want to use Symbolic content, using the process of evaluation? Fortunately, there are many areas in the study of the environment which have NUMBERS attached - percentages, whole numbers, statistical projects, etc. Let us see how we could encourage students to use the specific ability EST - the Evaluation of Symbolic Transformations. Let's review the product called transformations. It is a task requiring redefinitions or modifications of existing information. That is, a student somehow transforms the original material. We could ask students to take some of the statistics which are available concerning use or misuse of the environment - such as the amount of oxygen a person uses daily and transform this into a number on the basis of the total US population, both current population and projected population for, say, 1995. Or we could have him take the figures on the number of acres of arable land it takes to feed one person and then transform that into numerical information based on increases in population over the years. Or perhaps a student could figure out some numerical differences between the protein production of one product over another, in relationship to best utilization of the land. Or projected increases in fertility by using fertilizers minus the pollution damage of the same chemicals in our environment.

These are just a couple of many ways to use the S-I model to help you devise ways to increase gifted student's evaluative abilities. It is not hard to think of dozens of ideas which move away from static and pat assignments which all of us tend to overuse, toward more stimulating ones which afford practice of specific areas of thinking. For ourselves, there is a new feeling of satisfaction in the knowledge that we are more in control of what we are trying to do - that we are no longer just firing a charge of buckshot at a vaguely perceived target, hoping that some of it may come close to the bullseye.

I have several suggestions for materials which you might find helpful in planning for challenging the use of the higher level thinking abilities of gifted students. Most of you are already familiar with the Bloom and Krathwohl Taxonomy of Educational Objectives, Cognitive Domain. This model, like the Guilford one, serves to call attention to different kinds and levels of thinking. The Scheme for Synthesis of Major Contributions to Curriculum Construction is one of my devising, but I find it very useful because it coordinates these two major models in a way that clarifies their likenesses and differences. The Taxonomy is definitely hierarchical while the Guilford is much less so - but the teacher-planner can use ways to integrate these major ideas. For instance, depending upon how you structure your transformation and implication products, you may be requiring either inductive or deductive thinking. Similarly, convergent OR divergent thinking EACH may require analysis or synthesis. The two schemes are complementary.

If you want to play with the ideas of the Guilford model, you may want to work through the study problem sheet and try to use the Guilford model in ways that are similar to lesson planning...working in either direction--that is, beginning with a trigram and trying to devise an activity - or, starting with an activity and then trying to give it a trigram classification.

Like the S-I model, it is a tangible guide for teachers to keep us out of the doldrums of teaching for nothing but rote memory and convergent thinking. It opens up the possibility for students to explore materials at greater depth. The research evidence is very, very clear on the point that HOW teachers pose questions to students sets the stage for their subsequent thinking processes and the eventual breadth and depth of their answers. Your ability to effect positive changes in stimulating the use of higher level processes demands of you only that you learn to use the tools already at your disposal. Such a tool is Murray Sanders' little book, CLASSROOM QUESTIONS - paperback - based on Taxonomy of Educational Objectives.



Operations	Description	Sample Tests
Cognition	The processes in knowing, discovering, and recognizing. Includes some reasoning.	Vocabulary, arithmetic reasoning, naming similarities between objects.
Memory	Retention of that which is cognized.	Memory span for number sequences and/or for word pairs.
Convergent Thinking	Generating new inform. from known and remembered inform. Production of "right" and "best" or conventional or expected answers.	Completion of verbal analogies, picture sequences.
Divergent Thinking	Generating new inform. from known and remembered inform. Producing many diverse, unusual, unconventional answers and solutions.	Listing objects with certain characteristics, cartoon captions.
Evaluation	Deciding on adequacy, correctness or goodness of what is remembered or produced by thinking.	Finding incongruities in pictures, logical reasoning, judging identity of pairs of letters or numbers.

*From J.P. Guilford

Schema for Synthesis of Major Contributions to Curriculum Construction

Bloom's Taxonomy Cognitive Domain	Unit Test Products	Unit Level Operations	Behavioral Objectives
Knowledge	Units Classes	Memory Cognition	To define ... To devise ... To identify ... To imagine ... To recall ...
Comprehension	Relations Systems	Memory Cognition	To classify ... To debate ... To distinguish ... To recognize ... To translate ...
Application	Relations Systems	Convergent Divergent	To acquire ... To develop ... To increase ... To organize ...
Analysis (Deductive)	Transformation Implication	Convergent Divergent	To analyze ... To compare ... To contrast ... To differentiate ... To experiment ... To model ...
Synthesis (Inductive)	Transformation Implication	Convergent Divergent	To combine ... To infer relation ... To modify ... To relate ... To synthesize ...
Evaluation	Transformation Implication	Evaluation	To declare ... To document ... To evaluate ... To interpret ... To supplement ...

[redacted]

1. [redacted] convergent production of [redacted] in the social studies area.
2. [redacted] evaluation of symbolic systems to [redacted].
3. [redacted] convergent production of [redacted].
4. [redacted] cognition of concrete classes to [redacted]?

[redacted] categorize these activities in terms of the dimensions of behavioral model?

1. Children are memorizing the "Names" in the class-rules.
2. A nominating committee is deciding upon candidates to run for class officers.
3. A class is orally reviewing a chapter they have just read on the causes of World War II.
4. Three children are role-playing a scene they call "Asking Mike and Dad for More Allowance."
5. The teacher is having the class try to determine the causes for their poorly behavior at the 5th-6th grade baseball game.
6. A boy is watching intently as the teacher performs a Piaget "conservation" experiment with a ball of clay.
7. Kindergarteners are trying to decide which is a larger number--seven or four.
8. Children are using flashcards to review newly learned words.

SECTION MEETING: Regional Resource Centers for Handicapped Children: Impact on Northwest Schools

Question:

Well, I'd like to congratulate you who showed up for your courage. As indicated on the program, this is to be a panel discussion in regards to the development of the regional resource centers and their possible impact on schools in the Northwest. I'm Monty Montizama, listed on the program as being from the University of Kentucky , the change being brought about through the fact that I left the University of Oregon about six months ago and stuck those other people with the real responsibilities of developing the resource center located at the University of Oregon at Eugene. I'd like to make a few general comments about the background history of the resource center development, and then the panel members will give you more specific information in regard to the particular components of the program. The people you will hear will be Bill Wright, who will talk on the systems analysis organizational structure; a friendly Canadian, Guy Dahl of Calgary, who is working on the doctoral program at Oregon and who will replace Jim Young in regard to some of the more operational characteristics of the project; Eric Broughton, who will discuss interventions, evaluation, data collection ; and Don Benson, who will talk about the general relationships in the departmental services program; Jim Cresson, who is the current director of the project and also the research coordinator; he will discuss his views in terms of how research connects some of the activities of the project.

In general, the battle plan for the development of the centers nationally has to do with the proposals to develop twelve of these regional centers throughout the

United States. A year ago four of the centers were funded. One of them, you know, at the University of Oregon; one of them at the University of New Mexico in Las Cruces; another is in the state of Iowa, which is a combined operation between the state department, local service districts, and the educational district at the University of Iowa; and the fourth of the initial contingent was funded in the inner-core ghetto area of New York city.

This year two additional ones were funded. One is at the University of Utah, Judy Smith is the director of that project; and an additional one in Harrisburg through the state colleges, state universities, and state department of education of Pennsylvania. The intent is to work directly with local service agencies in developing some sound - hopefully - efficient ways of evaluating programs of behavior, and learning about the individualized prescriptions of learning programs.

These centers are not designed to develop as a series of - say - self-contained, segregated classrooms. In most of the centers, some kids will be brought to the center as such on a particular campus - but the educational responsibilities for the students will, in all cases, remain with the local district. Again the basic point is that we want to involve children in terms of giving service, but not try and represent any of the centers as taking away the educational responsibilities from the local districts. The second point I would stress is that even though we are funded from the U.S. Office of Education - Bureau of Education for the Handicapped - the services or contents of the centers will not be restricted to children in segregated classes. The only requirement is that they have some type of behavioral or learning disability, and whether they are in regular or special classes is of no great importance, for our purposes, anyway.

Another point here, is that there are no requirements in terms of developing any of the centers having to do with categorical terms and definitions. In fact, there is a very strong wish that people will not approach it on a categorical basis and engage in the usual kinds of name-calling that goes on in tagging groups of kids. In other words, they don't have to be mentally retarded as long as their I.Q. tests show they pass the criteria in order to be eligible for benefits from the centers. These things - these characteristics - will suggest that one of the major benefits of the resource center idea will be that it will stimulate the development of specialized programming on some other basis that just the usual restrictive, kind of segregated program centers, particularly in the category of handicapped kids. There is a very strong plus in the development of the center to keep it field-oriented - they should be a problem solving system that is very directly related to the field, and only minimally restricted to on-campus kinds of activities.

The network that was envisioned would hopefully develop and maintain some pretty intensive and extensive dialogue among the centers. In an attempt to facilitate this, the way they were funded was to allocate $100-125,000 for the first year to aid initial development, and the second year move to $175,000 on a non-competitive basis. By that I mean you didn't write in and ask to negotiate with them. All of the centers that were funded were just given $175,000. The advantage that we hoped would accrue from that is that people would be a lot less apt to be paranoid in sharing their ideas. We found in a related project within the BEH some years ago that one of our problems related to the fact that there was competitive grantsmanship-type of activity, and most of the people would not send their best ideas around the country and share them because they felt certain somebody

also would grab them, write the proposals, get the money, and they would be "had", so to speak. So this is one of the things we have tried to get around by making the funding non-competitive; to stimulate this kind of communication.

The dissemination function that is proposed at the University of Oregon -the major one- is to utilize very close working relations with the associate service centers developed through the regional guidance of the IMC, a special-ed and instructional material center. The intent is, I guess, to use the resource center primarily for the R&D development of prescriptive programming tactics, procedures and to rely quite heavily on the IMC approach for the dissemination and field distribution type of thing. This by the way, is one of the critical concerns that we have - to integrate the various projects and programs with the University of Oregon, so that when we have contacted the local people that it is represented in some integrated fashion. It is too common that we do what I call "tickle and dime ourselves to death on a million-dollar budget. By that I mean that we have demonstrated a real facility for manufacturing projects and programs in universities that go off somewhat independently, or capriciously, under the field on a rather independent basis. I don't think that the field really gets the full benefit of any of the projects because in many cases, they aren't sufficiently coordinated before they start out. But these are some of the basic functions that we are working on with regards to the development of the center.

The area proposed for the Northwest Regional is Oregon, obviously, Idaho, Washington, Alaska, Hawaii - and I would imagine that we would also be taking advantage of the development of the SE/IMC's in the Micronesian area, for instance, inside Guam. Without dwelling any longer on generalities, I would introduce Guy Dahl, who will discuss the more operational end of the business in terms of what we actually are up to.

Mr. Cash:

The staff of the resource center presently consists of thirteen full-time employees. There is an equal number of graduate assistants employed on a part-time basis. Actually, the important point I'm trying to make here in mentioning people is that the bulk of the budget is spent on people. What we are saying is that rather than a lot of hardware, the point of the project is purchasing and assembling for the center, people with general knowledge of exceptional children - with their specific expertise and diagnoses, evaluation, program writing, research, and administration. When we step and look, I suppose what we have here is what we expect or what are the components of a good teacher. This staff is charged specifically with the responsibility of "stimulating the utilization and demonstration of exemplary diagnostic procedures, instructional techniques, instructional materials, and instructionally based information systems and field settings". The key words are them, diagnoses, techniques, materials and field settings. In executing this assignment, the team is concerned primarily with developing models for and working directly with regular classroom teachers rather than becoming involved in a clinical, remedial setting of working with educationally handicapped students, per se.

Throughout this convention, there has been a great deal of discussion going on and there has been for the past few years now, particularly the last couple of years of a lot discussion going on involving the pros and cons of special classes. If anything, I would say our ultimate goal is to help equip the regular classroom teacher to adequately provide for those who have been put in her charge. To achieve the objective of helping the students by assisting the teacher, the resource center will aim to provide teachers

with the following categories of information and knowledge: a) behaviorally defined learning objectives and curricular organization, b) behavioral data regarding the learning characteristics of the individual student as the basis for initiating an educational program, c) learning process data provided by continuous evaluation to give the basis for controlled intervention and adaptation of the initial program, d) behavioral results to be anticipated when using specific techniques and materials under specified conditions with children with particular learning characteristics, e) and strategies to be used for maintaining learning behaviors and establishing relationships between, and among, learning objectives.

From an organizational standpoint, the classroom center has evolved into three major, yet very closely related, components. Bill and Jim will be dealing with the research, and the systems, here very shortly. The educational component is concerned with developing an educationally significant, exemplary diagnostic instrument, corresponding prescriptive programs, and a built-in, on-going evaluation system. Kris will have more to say on this matter, particularly the evaluation. Operationally, for the forthcoming year, we anticipate using the basic model of moving from minimal to maximal intervention on the part of our staff in these school systems. Right now, we are involved in developing the criterion reference tests in reading and mathematics which hopefully will become sufficiently accurate in pinpointing major areas of behavioral curriculum requirements and student deficiencies.

Once these tests has been administered, scored, etc., we will proceed with the following steps, generally speaking. Again, in going along with our original concept of minimal-to-maximal intervention only as much as we are required does we start off down here. Data are collected and charted by the teacher and students, and the center teaches the teacher and the student to do this analysis.

The teacher re-programs the children as she feels necessary on the basis of the

information that has been previously collected by her. The teacher is then provided with specific tactical suggestions for programs she implements in the regular classroom. This type of assistance we may provide her if she requires it. Going on to the next step, the center may then elect to provide the regular teacher with special materials for her classroom. Or the teacher in the classroom may elect to have these. These materials would be prepared by our program team, based on the information we've gotten on the students from the investigation - the criterion reference tests - and the data that has been collected over a period of time.

The center then provides a special teacher, or teacher aid, in the regular classroom to help the teacher to implement the program and learn how to use it. This takes approximately 20 days.

If the student, the educationally handicapped student, at that point in time fails to meet a criterion that has been set by the regular classroom teacher and the personnel that we would be providing to assist her; if the child fails at this point in time to meet this criterion, then he will be removed from the classroom and brought over to the University-what we call our Clinical Services Building, which Don will be talking about shortly. Here we will go into more extensive diagnosis and prescription, and then return to lower level as soon as possible.

We anticipate moving out this basic model using three slightly different approaches that are in keeping with our original intent of keeping non-school district intervention at a minimum, yet endeavoring to test out our model while still helping children. Right now we have "Plan A", where we are working with the

Eugene city school system is what we call our Cycle I, which we will run. Actually we are going to be doing the testing next week starting Monday and all of

When this program gets going, we will also go into a second cycle with the Eugene school districts. Another group of referred kids again - most have Title VI - this is the program that they have in their system over there in endeavoring to maintain handicapped kids in the regular classrooms and not have them placed into exceptional or special classes with ancillary-type people around assisting. Now we are looking at bringing kids into the school system - or into the Clinical Services Building because, primarily we are testing an awful lot of stuff.

We want to have a much closer look to see whether or not these programs are serving their purpose and doing what they are supposed to be doing and what we say they are doing.

Now then, in Plan A we would have students come into the system and we would also have teachers coming into the Clinical Services Building for in-service training. We will explain to them what we are doing, why we are doing it, and preparing them for getting these kids back into their classrooms. The second plan is completely field-oriented, as far as our staff and the students are concerned.

The next stage in this development would then be completely field-oriented type of situations, where our people would be going out into the field,and like is where Marty mentioned a while ago, a possible tie-in with the associate CMC centers.

In conclusion, I might mention at this point that we have opted - at this point in time at any rate, as an integrating factor in this diagnosis-prescription-evaluation - we have opted as an integrating factor, a data collection system based on the precision teaching model. I mentioned it several times in here - perhaps not the precision teaching as such - but the data collection. All of this - this format of data collection - has been at the basis of our investigation, of our programs, etc. We have in our using it, in test constructions and I have mentioned that it will be used initially in the classrooms, as it will be in the evaluations. I should mention, nonetheless, that I don't want to leave the impression that this is necessarily the only system we think will function, but that it - as an evaluating, integrating force - is as much up for evaluation as any other part of our program.

The next person who will be chatting with you is Eric Houghton, who is the youngest Canadian in the group. For some reason I guess they insisted on being first - because of the location of the convention, or something. Eric is, as suggested previously, going to discuss more specifically those areas related to collection of particular types of data, and application to the field of programs. Eric Houghton.

Mr. Houghton

That's right. I would like to share with you some of the ways that we are going to try to look at ourselves.... We have a couple of basic steps. I don't want this to be a short course in teaching, but one of the dimensions which we'll be collecting and looking at carefully, of course, will be the raw data on the performance of the youngsters. And fortunately, because of the ratings that the schools have set up and the kinds of things which they actually do, we have a situation where we

often can collect that very, very easily. Here, for example, is a worksheet from out of a first grade room. This is a youngster adding sixes; 6 and 1 to 7, 6 and 2 to 8, 6 and 3 to 9, 6 and 4 to 7 and it turns out that

the timing on it, as for example, is what they do here is that they time - in this instance - for one minute. So this youngster does ten, twenty, twenty-one, twenty-two, three, four, five, six, twenty-seven problems and so his his correct rate. If they are all right is twenty-seven correct per minute. This is very simple to analyze and very simple to look at. The validity and reliability are built right into. This is a sample of the kind of thing that we have been doing. We have the teacher actually using her curriculum materials So that is one of the second and very important dimensions.

they were going to be using their own curriculum and we were going to help do the analysis of this. So in terms of - as Guy was saying - development of materials, we are more into trying to help the teacher organize and individually tailor the materials to the youngster she is working with.

Now, in the third step, will be to do a more intensive analysis than is often able to be carried on by the teacher. We able to integrate and collect the information essentially on a shared basis, of course , since the data will stay in the classroom - but we will be able to share that information from several different situations, and thus be able

see the effects across different classrooms. Now one of the ways we will be able to do that ... I'll share some of these projects with you. The performance rate is, of course, a standard form of looking at youngsters, and then we will be using a chart like this, on which we can chart their actual performance rate. For example, that would be one per minute, two per minute, three per minute, four, five per minute, six, seven, eight, nine, ten - twenty per minute, thirty, forty, fifty and so on. The patterns that we are looking for [illegible] are youngsters accelerating on their rate correct and decelerating on their errors. And we will actually be looking with the teacher, at both of these patterns. One of the discussions which I thought I'd like to share with you on the whole issue of standardization was one that I think ... that I point out how important management and standards are.

The youngsters are being taught to do this charting. So our concern is that we introduce a technique - or a system like this - that appears to have some value to the youngsters and the teacher, that it be left in the system and not picked up when we change classes, or go into our second cycle. So these materials and the ways of handling them and working with them will be left with the teacher. Well, let's put down a little bit of

information and see what areas of it looks like. We have recently been working on instruments to try and identify with some precision basic skill areas. In other words, we want to know what performances rates look like in areas of the areas in which we will be working. So for example, our team has been working quite hard the last while on identifying areas of the basic skill areas in reading. And, here we have a discrimination test, which is similar to the Whitmore, where nine-year results words that have different sounds and that is the performance rate of youngsters, just a small sample of them.

Ten per minute is the lowest rate shown, twenty per minute is the highest and the mid of the group - the mid-rate - is about, as you can see,almost twenty-two per minute.

The next section over is letters written per minute, and of the youngsters sampled so far, the lowest rate was eight letters written per minute and the highest was about eighty or ninety, and the mid-rate was, as you can see - 18, 20, 22 or about 40 per minute. We have decided on the basis of this information, for example - just to show you how we use it - that the"letters written" portion of the inventory wasn't too crucial to our analysis and help in the area of reading. How it got there in the first place was that a teacher felt it was, and so we included it. On the basis of our analysis, it looks like its not too crucial, so we willdrop out the letter-writing and its analysis; and now we move over to one which we will keep - and that , of course, would be words - consonant sounds. We find that the youngsters we have looked at so far have sound rates from about five per minute to about eighty per minute. That is consonant sounds. In isolated vowels, the rate goes all the way from zero up to about seven per minute.

So this is the way we are looking at the youngsters - in terms of how they are actually performing. This sampling was actually done at the resource centre but it could go on in the classroom. We will actually teach the teachers how to

to do that kind of inventory. The error rate, of course, is important, as are the individual performances of the youngsters - and that is what our error-rate analysis looks like. Here are the command words with very few errors; high error rate to correct is initial. So we are actually concerned with the day-to-day performance of the youngsters and how to help the teacher look at that.

We are building, of course, some of these approaches some of simply themselves; we are building on some work on some work that was begun last year by one of the people by the name of Kim Stone, and here we have counting orally. This was an inventory which he developed for math, analyze see this youngster (Donna) started out - yes, that's right - at about 15 per minute. Count them, 1 - 2 - 3 - 4 - 5. By Christmas she was up to about fifty words per minute, and by - let's see - this was the fall , this was around Christmas and this was in the spring. So by the spring, she reached about 100 - 100 per - being able to count 100 per minute. Reading numbers, of course, is another important and basic skill. She started doing that at about 10 per minute, she got up to about 30 per minute, (by Christmas) - and she ended up at 50-60-70 numbers read per minute from the list. (This sounds awfully disjointed, but it is certainly what he was saying!!) That information, of course, is valuable - but our basic concern is how does that youngster actually perform in the classroom. Again, taking from information last year, this information does interest us by the way because Donna is part of the project this year. So we will be able to actually have a two-year picture of her performance. Here is Donna's addition performance, after she reached certain levels in her counting, reading and also writing of numbers - she then started doing additions of one. Adding one to a series of numbers. In the beginning, she did very little. By the first week, she was up to about four or five per minute. Then she

received some intensive instruction - in this case by the classroom teacher - and that raised her level up to about 25 per minute. This exemplifies how we would work in a situation where the teacher is given a youngster like Donna, then our commitment and our effort would be directed towards them - because she has a plan laid and it is effective - the resource center function can be to share that plan and that way of operating - in this case by Ann Miller - with other teachers, both in, and in some cases, have them directly involved in our project.

Then she moved from plus one to adding two numbers - two to numbers - in the first week, raised it to twelve per minute - and then with a little more instruction, coaching - what was in this case, a project aim - of twenty-five per minute. Here, error rate, of course, was analyzed also along with this because we need to have - the aim being, of course, a high correct rate and a low error rate. Not all projects are so successful as that, and another youngster that we will be working with this year - by the name of Deanna, who was in one of the classrooms of Eleanor Hoskin - started up with a very, very high error rate in her plus factors, and a very, very low correct rate. This was adding across as you can see - plus zero. So in other words, this was a copying project, but she was unable to do that with some instruction and a little candy which was one of those kinds of things which happens to get into this project - you see that error rate drops and the correct rate rises dramatically. Whether or not that was the specific recommendation from our team advisor or developed by the teacher, is up to the teacher.

We will try to make suggestions of any sort designed to help the youngster, and of course, try to take advantage of the teacher and her own concerns and her interests

with the youngster. I wanted to share with you what the day-to-day operations looked like, because I am showing aspects which excite me about the resource center I think, practically oriented in terms of the real problems of the Deanna's and Deanna's.

Some of the information that we have been getting already I'd like to share with you to further highlite what I consider to be one of our greatest potential areas. This data taken from projects that are ongoing, some in Eugene for example, and two projects in Palo Alto - which is somewhat beyond our area of direct concern - and as I understand, not even in terms of of the Resource Center. But one of the nice things about having standing systems analysis - is that data from any source can come in. Point me share this with you - there . Elizabeth Freeman is a second grade teacher, and what we have on this chart is the comparison of the mid-rate of the first week of reading words currently. Whenever the youngster spent - or entered reading - the first week: we took the mid-rate of that and compared that with the mid-rate of assessment sounds. See how this ties into the inventory, where we would like to be looking at these kinds of performances. As you can see, the relationship - in other words, what we are looking here is - this youngster is reading about two words a minute currently and has a sound rate of about twelve per minute. So we get one dot. It is like trying to find, you know, the distance from Vancouver to Prince Rupert, by land or sea. But anyway, you end up with - you have - you end up with one dot for each youngster. You see how they are related to each other. A higher sound rate is related to a higher word - a higher word rate is related to a higher

sound rate. It turns out that the relationship is very high. Point A-2: This is information coming out of a classroom, you see. It is not research. This is just Billy's word rate in reading and his sound rate. Now what does that look like in comparison with the youngsters in Palo Alto? That is how it relates. You see how another classroom simply adds to an already developing pattern. So it turns out that the only difference between Margo's group and Elizabeth's - you see, they are almost the same in sounds but Margo's group is a higher rate in reading. But the relationship still remains between sounds and words. They orally say the sounds, just like I would. I have a list of sounds like that.

one of our firm commitments - as a key - to try and see if we can actually improve techniques. If we can help see these are individually tailored to the youngsters particular needs, it looks like this is possible. So, in each of these classes, there will be youngsters who have learning problems, whether it be a regular class or a special class - it doesn't matter. As you say, if you have a sixteen-year old who isn't reading very well, well then, we had better get his sound rate going. That is one of the reasons why we are concerned with these nine-week blocks in which nothing happens. That is why we ask our participants to chart, you see. You could have seen that, perhaps, he wasn't gaining in a week or two and have made some kind of change - and we feel desperately that that is important - you see, that is very crucial. There is a lot of human effort that went in- to no effect.

Here is a third classroom - also from Palo Alto - and it relates directly to the data that we've got in Eugene. You can see that this pattern is very stable and quite consistent. It's at different levels because of different reading requirements. That is the kind of information which we are working

Dr. Martinson: Thank you, Eric. One of the biggest advantages of the precision-teaching type of process evaluation is that even though it is called precision-teaching, it's a misnomer - because it is more of an orderly system for monitoring whatever type of teaching process that you are using. As such, it isn't an instructional process or package - it is a way of monitoring whatever you do so you have a little more intentionality or credibility to it, and you are provided with process kinds of data that does apply you to intervene as problems come up. More commonly, it's the case that the kinds of information that we collect on kids is what they call "kill bar-on" information. We wait until the end of nine weeks, and when we get the information, either the kid knows or he doesn't. But we don't really equip ourselves to intervene at the end of the week - we get this kind of information after nine weeks. At least when I used to teach the sixth grade in classes for the mentally retarded that's what I used to do. Begin assignments, wait a certain period - a week, a month, a year - and at the end find out what we could do about it. But I wasn't equipped to do any business with this process evaluation . Your next representative of a project will be Dr. James Greene; Jim is, as I said, the current project director in functions - major functions - primarily in the area of developing the research department.

Dr. Crocone: Thank you, Marty. Normally, I don't share observations with audiences at conventions, but this one is kind of appropriate to contest, if not thoughts, so I'm going to do it. I'm standing here right now with no real idea of what I'm going to say to you, and that puts me in about the same position that I've been in for the last year, with a little bit different twist. I suddenly find myself in the role of an administrator, which I think I have adroitly avoided for the last ten years or so, who has the overall responsibility for the development and the functions of this project - and I find myself constantly faced with questions that I don't really have answers for. During the proceeding here, I spent a portion of my time as a research coordinator for the project. As I began to understand more about the concept of the research center, the potential of its service to educational organizations, I became more and more intrigued with this concept, and became more and more perplexed as a researcher. My perplexity was due to the fact that what to me - and what to many others, I think - has been a traditional concept of educational research this time had no place in this organization.

The reasons for that, I think, can be stated only if one has somewhat of an understanding of what the resource center is. It is a totally unique concept. It has as its purpose, and also as its goal, (which isn't too much to say - I think purpose and goal should be the same anyway) that the purpose and goal are to improve educational services for handicapped children. That is a mouthful. Well, what does that mean? I think before you can even answer that question, you would have to immediately start raising other kinds of questions. You have to at least ask these: 1) What are the educational services for the handicapped today? What forms, what contents, what methodologies - who are the teachers, what do they do - who are the children, how do they perform. Secondly, as a

general question, I think we must ask - given that we might know what education for the handicapped is eventually - how can it be improved, what must be done? Thirdly, in a similar move to the mundane business of salesmanship, the third question we have TO ask is what do we have to do to help? How do we have to behave in order to provide services, develop services, convince the teachers that we have something to offer - and more important, what do we have to do to help the teacher understand the technology, the logic, and to maintain her function in terms of improving services to handicapped children in the classroom - whether they be retarded, whether they be normal, or in the regular classrooms that contain whatever. Well, in terms of research then, the only conclusion one can draw, I think, is that in terms of the resource center concept, research must be the sum total of all of these questions. And in a sense, research is probably questioning in a much different respect than we have come to think of as traditional - as researchers in education. Also, having recently taken Marty's job as the acting director of the center this year, and no longer being able to play the game of machine so that I can do the research and let somebody else worry about the administration - I find myself being - becoming - interested in other kinds of questions as well. Particularly, what is the center? What can it do? What is education and how can we react to the business of it as such? Well, in this respect there are at least two unique characteristics of the resource center - unique in the sense of centers and projects typically funded by the federal government of the United States - that is, 1) that rather than being average higher organization - even though we are based in a University setting - our job is to get out there where the problems are. Go to the teachers, the children, to the systems in the field. And secondly, this is not a specified sort of characteristic,

but to me it is a very vital one and it is implicit in the very concept of a resource center - and that is we must remain flexible in our approach to these problems. Rather than to push a "bag", as Marty said, or a particular model or a particular set of methods, or a particular theory of education - I think we are charged with and must advance these approaches so that problems in education will not approach through extinction. Rather than to design and develop exemplary programs, I think that what we should be doing is make our exemplary programs something which provides alternatives to teachers, not an alternative but alternatives in the fullest sense. And then if we continue our questioning process in relation to that expression as a basic issue, we will begin to see the processes of questioning as so closely related to the processes of service, and the function of the resource center and the function of the teacher and the classroom - and the whole educational concept. And also that the variables are so very complex and so tightly imbedded in so many different aspects of the educational process, and also that - in the traditional sense - controls are still unavailable; so difficult to utilize - experimental controls. That makes it really difficult to distinguish between service and research.

The title of this particular section of the program, you will notice, has a question mark after research. And that is really what I have been doing for the last year asking myself, "Are we really talking about what traditionally is called research in education?" I don't really know that we are. I think basically what we are talking about when we think of research in relation to the resource center and the purposes and goals, is simply a matter of matching problems to tasks. Data presented on our evaluation team - and I think we reached an agreement sometime during the

preceding year that if we are to be successful in finding out what we are doing with children, we need to ask some very serious questions about what is it we should measure, in order to tell ourselves the effectiveness of what it is we are doing. Immediately, one starts thinking in terms of what's measured and not measured. You can begin to see the value of a system of measurement that's ultimately - in terms of present technology, at least - precise, and which has the characteristic of being standard in the sense that we can look at data coming from all parts of the country and compare it with ours. Eventually, we can build standards of intervention or standards of educational processes which can be helpful, not only to us, but to the teachers we work with.

So I think maybe a base - the thrust of the research, conceptually - has to be that. Who is the best man to do the job that needs to be done; whether it be a researcher, whether it be an educator - who cares? What is the task, and who can be matched to that task? That is essentially the approach we have been taking, and I hope it proves itself, and so far it has. In a sense, Guy Diehl, who is our Educational Services Coordinator, is conducting research at this time having to do with politics , intercepting the rest of his duties with reviews and with all sorts of inquiries - asking questions in terms of specific conditions by which they can be answered . Eric mentioned that what he was presenting to you was not research. Yet it involves the same processes: inquiry, what is the problem, how can we define the problem, and how to proceed to help it. Our educational programmers didn't come today, so were not able to discuss an aspect which I think is extremely vital. That is the intervention strategy to the inquest - the same questions have to go on there. What is it that has to be done, what can be done, in terms of articulating these other functions and their functions. So regardless of who we have on the staff, or what

our targets - the problems, what it is that we have to deal with - our thoughts, we feel, must involve - of course - the child. That is our basic dependent variable, speaking as in terms of the research. We want to effect change in the child - in his learning, in his behavior and so forth. But the teacher herself, as a person - her behaviors, and the materials she employs will constitute the variables that will produce the effects in the child. So from that point of view, the teacher herself is a dependent variable in this process. It seems also obvious that the system in which the teacher and child function - some aspects of that system, at least - constitute additional variables, which are some methods which hinge upon the teacher and the effectiveness of her work and also sometimes depends on the child in terms of his performance. The usual process then, whether we are talking about attempting to work three levels or at only one, has been the CLINICAL PROCESS as our target.

It is also quite difficult, particularly in research-oriented or experimental kinds of programs, that these effects are evaluated in some fashion, or at least an attempt is made to evaluate them. In many cases, that is as far as it goes - in terms of federally funded projects, or school projects of a certain types - you try something out, and you evaluate it. Sometimes it is quite possible that you can extend that. You can use the feedback from your evaluation to inform you as to what types of modifications might be viable, or that there might be something important in the project. These modifications can then be fed back into the clinical program or the educational services program. That's really not a research function at all,

or is it? Perhaps what is more like research, in the traditional sense, are the things that are in the middle part of the diagram. If we are going to think in terms of program modification based on outcome evaluation, probably what we are talking about are observation technologies to be fed in there.

Question:

Where do these come from?

Answer:

From the consultant, from the top of our heads, where might they be fed into the educational services programs through a systematic process of asking questions, and trying to determine answers and evaluating answers in terms of alternatives to the programs. Well, if it is true that we should use some kind of a formal, systematic method of designing and producing alternatives, there are at least two areas that seem to be relevant there. These terms may have meanings somewhat other than I have used, so I will define them briefly. Learner characteristics, of course as you know, are what you see in the data that Eric presented, and bear a direct relation to what I would call "learning" characteristics. Many other things bear on learning characteristics as well. How the child performs

| | the types of materials which he is responding to, what kind of classroom arrangement seems to facilitate his learning the best, what are the - how does the child respond to the different aspects of the educational processes. This term, social ecology, is a little more difficult to define. It is a popular term these days in the United States at least. Behavioral ecology, social ecology, whatever - all the way from pollution to the child and the teacher - that describes the term ecology these days. But to me, what ecology really means is the interactions of the child with the environment - environment including the future

their titles are, basically all of us are researchers - in the sense that I am presenting the idea of research.

I think it is becoming obvious - and I've heard other people talking about this same type of thing across the country in recent months - what we are really speaking of if we call this research is certainly a new concept of research in education. It's not the standard experimental model where a teacher, administrator, administrative assistant, or graduate student wishing to do a dissertation, approaches you and essentially convinces you to try Brand X in your classroom for three months - and perhaps Brand Y for three months following that.

Thirdly, let's not - for this - re-name research. I think what we are referring to as research is really a sensitivity to the educational process. The question asked is whether we can handle sensitivity, rather than hypothesis testing as such. Certainly hypothesis testing has to color the picture in some form. But at this point, it seems remote to me. I suppose in that context, of being one of the processes that are remaining sensitive to education and its processes, then so far as research as a component of the resource center goes - if anything - it is a support system for the service which is provided.

I originally thought about presenting a lot of data and then I learned Eric was going to do some of that, and the truth is we don't have a lot of data from last year to present anyway. But I did want to sort of give you an idea of the kind of thinking - as a researcher, or a less researcher, or whatever it is that we are - we have gone through in the argument-kinds of positions you have heard so far. This diagram roughly encapsulizes what I have just outlined for you. If we take, first of all,

perceptible light in the room, whatever it is that may in some way affect his behavior. But the interaction, the reciprocity, of the child's behavior with the environment is what is meant by ecology.

In terms of conceptualizing then, for our research - may it fit correctly in a more traditional sense - is in the research and development kinds of functions that make fun off of at least these two kinds of exploratory ventures. Adding the fact to this, we could be producing or designing alternative technology to feed back into the system.

So we have at least two kinds of characterizations from the resource center, or any such operation. One is evaluation, and the other one is research and development. There are, I think, ethical to each of these in carrying out its objectives. This particular diagram I put together last summer when I was research coordinator, and to some extent I put it here today because I wanted to give you some evidence of how a researcher's thinking changes when he is forced to think - which maybe you don't agree with me. I put this together last summer when we were trying to make out the organizational structure of the resource center, when I was thinking up there, "Where does research work fit into it?" I was still thinking in terms pretty much of traditional types of research. I thought, "Well, these dotted portions really represent research as process or operational - that's really where our responsibilities are." We are going to fling around here some until its retires, and we are going to take a little bit of data that comes in from the field - the most important - and what we're going to do is we are going to play in our laboratories, we're going to design all kinds of technology. I thought at the time that was a rather effective possibility. But we were also cognizant, of course, that there was a role to play outside our

ivory tower. A remark close to that at the time was, "Well, really we're not going to be doing much research in that sense. What we are going to be doing was either advising those people out there who are helping kids, or we're going to be consulting with them!' The vertical lines would represent what at that time I thought of as an adviser's sort of function; that is, in terms of finding out what it is which is measured, how should you measure it and so forth, and then the actual cost list of the measuring and the analysis of the measuring.

There's not really the problems of research here, that is what those folks out there are to be doing. The horizontal lines represent more the consultant's type of responsibility, that gets us even farther away from the whole thing. If somebody asks us a question - yes, we'll give them the best answer we have at that point in time, but don't get too involved, you know, you don't have to be there at all, really. So in terms of the program modifications, there is a multiply interesting effect here. While we might design the alternative technologies for them, once we design them, we really don't give a darn about what happens to them. You see, we just want to advise and consult with the people. You try this, and see if it works, and we'll catch up with you when it comes back around here and see if you have followed it. Well, I'm poking fun at myself a bit and I'm also poking fun at educational research generally, I think. I think that it is probably about time that we did this. So anyway, we, as I said when Marty left rather suddenly and somehow or other I landed in his job, I started thinking pretty differently about a lot of things. One of them was - okay, if we are really going

to be involved as a center, remember now that we are saying that this center is research and all of us in a sense are researchers - what is it we have to do? One thing is, of course, we have to know - or have to ask questions about - what is it that is measured, and how should we measure it? I wanted to point out to you in advance that this also is in the context of poking a bit of fun at education, research and myself. What to measure and how to measure. Well, we have a wide-range achievement test, which is the standard tool of many people in education.

Often the question asked about this is, "If I do something with these children, are they going to be gaining in the rate, or in any other phases?" So I thought we would present a little data from last year, with another example of children. The triangular dots represent the gaining scores of an experimental sample of children we have. In each case, some RAT reading, RAT spelling, and RAT arithmetic battery, and the enclosed circle represents the gaining scores of a small sample of controlled children. The lines between them simply are visual aids to help you see that - by golly, yes - the experimental kids gained, and they gained more than the controlled group did.

You would be surprised how many studies you see today that basis is their steadiness of effectiveness of value of some operation, essentially this kind of data model. I think that perhaps we all know that's not entirely the best way to go about things. So this being after a discussion of the problem of gaining scores, and so forth - let's talk a moment about different kinds of ways and levels that people go about measuring people. This again is data from the RAT test. It is data representing three tests, and the middle test which occurs about six weeks following the pre-test, and the post-test, which occured about two months

following the middle test. The upper portion of the chart represents the raw scores on the RAT test, and the lower portion of the graph represents the norm of the data which we used. Well then, just looking at those figures and checking those squiggles on the paper raises some very interesting questions. For example, how come these lines look different from those lines? What happened here? Theoretically, if this is a good, precise, exact measure - while a norming process the measure might fall at different levels on the graph - they ought to look pretty much alike. They ought to have essentially the same shape and configuration. Why don't they? How come - in terms of the children's raw scores, which is pretty close to their performance on that test - the two groups aren't separated very much at all? If the gains are there, they are very difficult to see, even though - as were seen before - the gains can be magnified very nicely by charting them in a certain way.

How come if it is true that the closest measure of performance looks like there is not much difference between those two groups, but when we use the norms scale, it looks like something happens. Now we can also note - very interestingly - that the experimental group is not where they ought to be. It is a kind of unfortunate circumstance, but they did learn and we have other data to show that. So I can say that we're criticizing ourselves too severely on this point. What I am trying to do is point out the fact that one might raise the question in terms of level of measurement. Our job is to improve educational services - and if this means working with the child to somehow permit behavior, to make him learn better, or whatever it is - ought we not use the most precise measure that is most directly related to whatever it is that learning involves. It seems obvious to me that because of astute distribution of some type in our sample of children, the norming process

distorted the actual picture of how the children were performing in the classroom. This very data gives us a little bit clearer picture, I think, of this than the norm curves. If we were to call them, this type of test a parameter reference test; that is, one in which you take a child and compile his behavior, and then you compare him with the whole parameter of population of children, I guess the conclusion we can draw from here is that it is probably not as valid as other methods, because it doesn't tell you much about what you are doing or what the child is doing - to be very satisfactory.

The second kind of question that we looked at

the second level of measurement. Parameter referencing is where you take one child and compare him with the world. Criterion referencing is another kind of an interesting concept of measurement that has come about more recently. That is that there are criterion for a child's learning, and why don't we measure his performance with the respect to these criterion? This is rather than in respect to every other child in the universe, or something like that. So we have here one example of the criterion reference test as part of the battery that was developed in Lakewood, Kansas over the past several years, in conjunction with their education-population center which is now demised, I think, but is still somehow alive in some other industrial processes or something. At any rate, they did develop the kinds of tests that we alluded to a little earlier today. What this shows is perhaps, in comparing if you can recall the other data, that it is true that the kids weren't really very far apart in their performance.

What's also interesting is that we get a much more precise effect of the difference from Time 1 to Time X here on the chart. Again, that shows the original notion that if we are going to be faced with the idea of measuring, then perhaps we ought to think in terms of what kinds of measures are important. Certainly something which is closer to the actual criterion of learning would be more significant than something which is attempting to compare a child with a population geared by some kind of magical statistic or something.

There is even another kind of level of measurement, but I am not going to speak about this very much, except to point out some of the effects of it. Again, we have a sample from the Lakewood battery, which shows a very flat line. Why does it show a flat line? Well, because that is where the test stopped. The kids didn't stop there, the test did. They reached a ceiling, and there is hardly anything you can do about measuring a child at that ceiling. It doesn't tell you anything; there is no bearing produced from it. But what would happen if you'd take that test and put the data into the form as rate per minute? Or some type of other, more precise measure. What it does for you is essentially eradicate the ceiling because if there is a limit to learning, it is probably not related to a test, or to study materials or whatever. It must be something else.

So they have removed the ceiling simply by rating data - a ceiling rate per minute. Also, what we have done is show that it gives us a much more sensitive measure of the child's performance, expressed in terms of the graph, so to speak. So it is more precise and a more sensitive instrument. And that is all just by way of showing

our reasoning in terms of one of the aspects of what we are talking about as research; that is, the evaluation model where research probably plays it's role at its particular best, where it is the most precise, and most valid in terms of ways of asking questions about kids and entering this data. That's why Eric Haughton is a member of our staff. I think he represents the best technology of measurement in education today. Okay, the second half of the problem of this sort of thing, is feeding into the system the R&D functions, the production of all kinds of technologies, or whatever you want to call it. I wanted to give you a couple of brief examples of what is meant by learner characteristics, for example. Eric alluded to this also. Simply by getting a bit more information that we might normally think of on a child, we can learn much more about his behavior. For example, I think that the typical teacher - or for that matter, the typical researcher - often thinks only in terms of what is a child doing correctly today. How is he making out? Is he doing okay in terms of the references that we have?

This gets us into a whole other kind of periodical fact in terms of our learning theory about the child himself. Part of this tradition is perhaps not good. What if we quickly look also at the child's errors today, tomorrow. See what happens? We have done something with these experimental children that somehow - overall - produced a gain in the correctness of their responses. Now this is not rated data, by the way. This is simple number correct. But we're at the peak resting period (coughing interrupted) which represents about a four month span. Look what happened to the errors. That shape is almost exactly the same as

that stage. We've accelerating almost everything with that kid. She's just doing things faster. But is he learning? If he were learning, wouldn't we expect the errors to drop as his correct rate increased? See how much more you can know about the child - not only in terms of accuracy, but taking the two together, in terms of proficiency as well. So, a learner characteristic might be simply that a child responds to an intervention, or a contingency or a program, or it might simply be that word: he just goes in here and does everything faster. For another response of a child, another characteristic might be, that his proficiency improves by virtue of this program. See, this child's proficiency, in every all gain in correctness, total number of correct- didn't change much. But look at the error. It really dropped and that's good. He learned something from this. What is meant by characteristics of the learner then, is why? What is it about the child's behavior that differentiates him in terms of some approach? Well, we don't know about this, of course. All we know is that there is something different about these two children and these two conditions.

One other kind of question can be asked is the difference between working and proficiency, so to speak. I think if the teacher sees the child diligently tending to a sheet of paper or whatever in his classroom - she might assume that child is working. So might anybody else. But does that really mean the same thing as what we want to measure with the child? These data represent an apparency measure of past attention, or relatedness. If a child appears to be doing something in relation to a task, it is appropriate to simply measure him at that time. If we didn't really know what he was doing in terms of these measures, we are simply measuring the apparency of his working behavior. This is over our project period.

The baseline data is where we simply took the information on a child prior to any kind of an operation with him. What is called experimental time here, is where we intervened with the child. The first stage of intervention is where we removed him from his classroom, and we bring him to this kind of service facility. These two are the second intervention, where we place the child back in the classroom with some support for the teacher. These latter two data points are the follow-up period. So you can see what happens. In a classroom where we introduced a mathematics program for the children, their appropriate of work frequency first accelerated when they came to clinical services, stayed about the same when they went back to the regular classroom for a while, and then began dropping off. The same thing happened in a second classroom

in which the teacher emphasized the language program. The kid seemed to be working more for a while, and then he seemed to drop out.

So does this mean that he is learning less, or not learning less? One way we can find out about that is to compare his learning behavior with proficiency measures. Now the data below here represents the Stanford reference test on another battery that is still the same type of thing - a proficiency measure, so to speak. We can see that this kid - yeah - his work-like behavior dropped off and his proficiency also dropped off. Aha! If we want to shape up his proficiency, all we gotta do is make him look like he is working hard, right? Well, maybe not - because look over here where the same effect in terms of his working behavior occurred, but look what happens to his proficiency.

It continues to improve over a 5-month period of time. Again, this is something about learner characteristics, we know there is something different about these kids. We don't know what it is that is different exactly. How can we begin finding out something about what's different? Well, that brings in another kind of question asking. Again, many theories can be applied to this. So let's take this one for a moment. The bottom lines here represent our measures of teacher contingation of Pat's behavior. That is, if she said to the child "You are doing good today", or "Gee, this is a nice job" - or something like that - we've counted that as a contingation of his past behavior. We can see that when he was in our exemplary inner-tower program, he got an awful lot of contingations - that's for sure. These seemed to have some effect on his proficiency, but not even these with the Rotten reference test could alter the past appearance of thing.

Also, then something happened when he went back out into the field. He didn't get contingated nearly as frequently as he had, and the interesting thing about it is that the proficiency seems to track the contingation, or vice-versa. Let's look at the other one to see if that holds. The kid's proficiency, even though his work behavior seemed to falloff - his apparent working behavior pattern fell off, his proficiency continued to increase. Well, what's the difference between these two? The only difference really is that contingation, in both cases, came pretty close to tracking the proficiency measures. So maybe even if the teacher is reinforcing the kid's apparent working behavior, what he is really reinforcing is performance, the proficiency. If we were to ask why does the child attending the class drop out, in terms of learner characteristics there is one conclusion we might make from this. That is he simply doesn't have to work as hard; therefore,

be doing something else part of the time — where he might be looking like he is working. And yet, he still is increasing proficiency as a student. That might be kind of important, because if we learn in the long-run that when a child becomes proficient, he spends less time involved with the task. That has a lot of implications. For one thing, it might indicate to us that we're not particularly challenging him. Maybe the tasks aren't great enough, or complicated, or sufficiently challenging to him. So that as a learner characteristic, where we see the proficiency increase but his attending to the task drops off, maybe the materials that is not challenging enough. Maybe it's something else. Or what else is it? One thing we can do is say what is he doing when he is not looking like he is working. In our data it turned out that the thing he was most likely to be doing when he wasn't working, was interacting verbally with a peer — or in some fashion, with a peer. As a learner characteristic then, we might establish the fact that if the kid's proficiency is at a level where the material is no longer challenging, then it may be the case that interaction with peers could be a characteristic of a learner, which might actually inhibit future kinds of learning.

The relationship here is almost a perfect one, inversely. When a kid is working, he is not responding to peers and he is not working, he is responding to peers. As a management aspect in terms of teacher responses to a learner characteristic, we might be able to draw from this a conclusion to the extent that — well, let's find out what is the optimal level of stimulation and what is the optimal level of peer interaction, match up the learner characteristics and program and plot these so that we can do the best job we possibly can in regard to this interaction. Well, anyway, that is a very long-winded and very dry explanation

of what it is research might look like on a day-to-day operations level. In trying to relate it back to the kinds of questions - the kind of questioning operations - that I think is really the basis of research functions in the center. In summary then, I think that regardless of the innovative part of research skills, we should put this all back in the context of what we are doing. That simply is trying to find out what is it about children that makes them learn and not learn, behaviors; what is it about teachers that helps a child learn and not learn, and so forth. To the extent that maybe we could get some ideas that would be helpful to teachers who have these children in their classrooms.

It is simply, then, a service afforded by these systems of education - nothing more. I think that in context we must observe a bit more. But that really is a scientific support system of education. To me this is an exciting kind of concept, because if we are really successful - in the resource center or in any other kind of operation that has as its objective asking questions and providing services related to these questions - that if we do, in fact, end up with improved services, the result of that may be simply an upward blending of both science and education in a useful kind of way. I guess that basically that is what I think our concept of research in education today. It is really a blending of science and function. I guess in a sense, that is what the resource center is.

Mr. Martinson:

The next speaker will be Bill Wright, who will talk more specifically in regards to a systems ~~design~~ service for the organization, an organizational

Mr. Wright:

Talking about a systems approach to anything is it seems to me is almost like talking about the subject of Western civilization. Its growth and development - is it massive. It is a very big topic. I hasten to point out to you that I am not a systems person per se. Rather I am a student of systems, because the study of systems is relatively new, at least as a science. Consequently, it is extremely demanding from the standpoint of keeping current conceptually with what systems are all about. At least keeping current with them conceptually fast enough that you can apply them to your project or to your organization in time enough so that they will do some good.

Systems orientation, I think, attempts to define or portray what goes on, rather than make qualitative judgments. Rather than justify or defend- if you will, the systems orientation attempts to tell what is, rather than what ought to be. So that if you were to come up to a systems person and say something like this, if he or she were a true systems person, he would answer accordingly, without attempting to justify. Any kind of project can be thought of as a perfect solid if you will, and somewhere within this configuration of lines there is a perfect star - or an organization - and it is the job of the systems person, as I define it to sort out the lines in such a way as to delineate the perfect star, which is right in there. See how easy that is? In about five minutes, I have the project well defined and well sorted out for all who care to review it.

Most scientists, at least of yesteryear, like to think in terms of a project for an organization as a black box - where you have input - and something happens inside the black box and you have output. Consequently, your output would effect

the environment which you have chosen to work toward. I think, first of all, the systems person is going to be concerned with giving to the systems area, to the systems field, to the systems job and to other project members, a pretty careful set of input in terms of interrelatedness and in terms of sequence. What happens first, what happens second, what happens third, and how does one interrelate with two, and how does two interrelate with three. Then the systems person pretty much steps out of the situation, and lets happen whatever is going to happen to the black box. And then he comes around that number three over there on the output. Again, he lays things out in an interrelated sequence of action for people who are interested in replicating that particular system.

For instance, a year from now you may want to replicate a certain portion of this operation. Some of the questions that you ought to be asking, no matter who you are whether you an administrator, or you're a teacher or whatever - are: What types of personnel is it going to take to do this task? How much money is it going to cost? How much time is it going to cost? What kind of material are you going to need? How do all these people line up ? When do they come on stage? When do they exit? What kinds of performances do they give, in essence?

In an attempt to get a handle on this, we're starting to use a system called PERT - Project Evaluation Review Technique. I think the first thing that is going to happen in any kind of a systems approach is to sit down with the people who compose the system, and get them to differentiate between their real and their stated objectives. If you will hearken back to the perfect star again, the lines that didn't really make up the star at all became the stated objective. The real objectives were where lines

crossed and formed the perfect star. I think in any particular organization you have a difficult time, if you don't sit down and sort out the difference between the real and the stated objectives. because a stated objective is the kind of thing that you say you are going to do, and a real objective is that which you end up really doing. You may start off by saying "I am going to do thus and so", but as with the process of the black box. what comes out may be something entirely different that what went in.

Here we see, on this particular transparency, fourteen milestones. A milestone is nothing more than a general classification of what is going to happen in the resource center between October and December 1970. For PERT to work, you have to assume that everything that takes place within the center of operation will naturally subsume itself into one of those major milestones even down to the secretary-typing-correspondence work - this aspect for the project. That secretary's typing better come under one of these milestones, or you need a new definition - or re-definition - of the definition of milestone. So that when you have all your milestones stated, you can lay them out in sequence that will interrelate one milestone with another. Hence, we start off the project and we go to number one. We have to finish number one before we can do two. Two leads into four, five and six, three, seven, eight and nine - and all these kinds of things can happen relatively independent of one another, but all of them have to be completed before you can go to ten.

What happens if four, five and six take two weeks and seven, eight and nine take four months? And if three, perhaps, takes ten minutes? Well, that means obviously that by the time that you get ready to go to number ten, you've got a lot

of people up here in four, five and six , and perhaps, material and time, tied up to the extent that its a wasted function. Perhaps expeditiously those people and that time could be better used down in seven, eight and nine to shave off that months figure. So this is basically what we have on the milestone. Each milestone breaks down into a work package. This particular example: maintenance of the regular room. We have a planning and development liaison person. This person comes from the planning and development committee of the organization, which as far as the resource center is concerned, are four people , research, evaluation, programming and systems. Planning and development liaison means that one of these individuals from the planning committee is going to be responsible for telling this committee what is happening in this particular milestone on a day-to-day, minute-to-minute, hour-to-hour, month-to-month basis.

Each milestone will have a mission director. This person is the chief worker in that milestone. His job is to try to tie together the people, the time and the activities in such a way as to accomplish that particular milestone. Then obviously, you have the mission workers. The mission director and the mission workers, in order , are going to be collecting project data from the classroom teacher, are going to be advising the classroom teacher, they are going to go back and repeat milestone one, they are going back and repeat , well, milestone one, one through four, and repeat all of milestone number two. It gives staff assignments here. So what you have is a different type of an organization. It immediately eradicates the difference between chiefs and Indians if you will, because everybody, sooner or later gets to be an Indian and everybody, sooner or later, gets to be a chief. So in essence, the planning and development committee on the traditional organizational chart looks like this, and then you just have a whole series of making changes to get the job done to

October and December of 1970. It doesn't make any difference if you have a staff of three - or like Robin Leach - command a staff of 100,000. You can account for everybody's time, you can account for the money that is spent and you can account for how they interrelate to one another in the process.

Let's take a look at one of these milestones. Each milestone is stated in the past tense. So this one was maintenance made in regular classrooms. That means that the arrow leading into number three is the time, or the activity, involved to complete number three. We'll take a look at number three. We can get a little "te" for number three. In this particular instance, it may be five days. Everybody pulls together and if they can give three basic time estimates, pessimistic, optimistic, and mostlikely, we can get a figure of 5 days that it will take to accomplish number three. That little"te" is used numerous ways, but the least of which, is to determine a date "te." Early start , what is the earliest that we can start number three? Well, October 20, add your little "te" on to that and you can be finished up October 25, early finish. Assuming things don't go quite according to hoyle, what is the latest that you would have to get this thing finished? Well, December 24 - subtract your 5 days and that means that you would have least have had to start the thing by December 19.

Well, there is a tremendous disparity between October 25 and December 19. This would would indicate, in advance, this kind of thing is done well in advance actual execution , this would indicate that this a point in time where the staff might sit down and take a more careful look at this function, because there is the potential of a tremendous amount of wasted time if the earliest start and the latest start are that far apart, in terms of months. And so this enables the staff to more effectively utilize

their time and more effectively utilize their personnel. This gets into the the aspect of evaluation, the process of evaluation. How is it that I can best conceptualize the project so as to estimate and anticipate some of these pitfalls before they even happen, or before they occur? Continuing on with number three - how much does it cost? Well, in terms of salaries it is going to cost us $450, in materials and supplies $200, in communications $47, and $21 for transportation.

These are just examples. Depending upon the kind of budget that you may be working with, you may have 70 particular program planning and budgeting items that you would like to figure in on these time lines. Here again, we are monitoring the difference between stated and rated. At this point in time, we're stating that this is what it is going to take time-wise and money-wise. After we finish this, we can go back and compare our failure, and determine how close we were. Thus, this gives a very careful record. If you would like to replicate number three, wherever you are, get how much time it is going to take you, the kind of people that it is going to take, how much money it is going to cost, and in which direction that money is going.

This is an overlapping, dove-tail approach to program planning in budgeting systems. With all of the figures, with connections in some types of magical formulas, that I have given you - you can come up with the probability of completion. Stating far before that even number three ever happened, what is the probability of it happening? Here is the way we say it, pointing to p oint 8 on this one, which is pretty good. But if it happened to be much lower than that, we would have to back up and take a look at where we went wrong. But this enables us to do so in

enough advanced time that we don't have to do this when the actual process involved is going. That as briefly as I can possibly can without leaving out great, deep chunks, is the best way that I can explain how systems orientation is going to effect the regional resource centers.

We are also going to be taking a look at the matrix in which the resource center is involved from a systems standpoint. We'll be taking a look at the University itself, plotting out the university system and determining how it functions in relationship to the resource center, plotting out the district in which we are working, plotting out the school districts, school, the district and state. Here again, with an attempt to analyze. In effect, what sorts of constraints and what sorts of factors are going to be influencing us, and how best can we regulate and control them. Thank you.

Mr. Martinson:

Thank you, Bill. The last person to present is Ben Benson. I was in error before - I indicated that there were two people from Canada. Ben migrated to Canada from South Africa and England, so I would guess that the last bearded player on the team also is in the native contingent. Ben is the director of clinical services for the Department of Special Ed at the University of Oregon. Thank you.

Mr. Benson:

Essentially, we are involved in generally trying to develop a new list of ways to do disciplines within the program. The study so far has found itself to be - or managing to be - a revolving kind of thing. We have a new program which was designed for trainees -for observation by schools - and this time we did not go into

the resource center function. Conceptually, I think the clinical services program, as it was intended over the years to, matched very similarly with the kind of concepts which we got for the resource center.

But with interest in the air, there will be the development of a program beginning in the near future, to facilitate training and research. Now we are interested in the training, I suppose particularly, of the broader disciplines because we can then adjust them for the educational people. Obviously, as long as we are dealing with handicapped children, we aren't going to be able to ignore some of these other disciplines.

We would like - in some cases, I think - to modify their function - I think - that a reminder of the need of the clinical discipline of the team is a traditional one. I think of a story that I heard the other day where a psychiatrist said that he had a patient come along. And the patient said "I've been having difficulty sleeping." He said, "Every time I get into a - start going to sleep - I find my self driving up to San Francisco. It is a long trip and I get very tired. I'd like to get some sleep." So the doctor said, "When you get to Fresno, why don't you let me take over?" So the fella came back a while later and he was much better. But he said, "I've got a friend and he needs some help. He has a problem because he - whenever he is going to sleep - he finds himself lined up with about a dozen trees that he's got to chop down, and I got about to the sixth one, and just am completely exausted". Well, the doctor said again, "I think I can help you there " - he said about the same thing - "When you get to the sixth tree," he said, "why don't let me take over?" A little while later he came back looking very, very exhausted. He looked worse.

The doctor said, "Well, what's the problem?" And the patient said, "The trouble is that when I get to the sixth tree, I look around for you and youre driving some nut to San Francisco!" The reason that I say that is that this is child guidance so, you know, a complete "myth" symbol, where they are using language here as a myth. I think that with a lot of our existing programs that is what we have been doing.

Our argument on this in terms of why we would like to facilitate a change in this mode of operation to a much more performance-based program - very similar in lines to what you have had here today - is because we feel that in the past much of the multiply-existing clinical programs handling children with problems, very often major problems in education, have been far too descriptive in the way they have approached problems. Very often they have described the problem excellently, but when the teacher, or parent, or whatever agency who had sent the child got this data, they found that there was no articulation here in terms of how to deal with the problem. From that data, they would try and make theoretical kinds of "leaps" - from this data - to attempt to get a program going. As you can see here, the attempt here is to become much more precise and much more performance oriented. Therefore, if we are concerned with questioning the discipline process here, we are interested in our University-based program with getting a hold of the physicians and the psychologists and the counselors and others - and attempting to make a much more rational, functional use of the problem-oriented approach to this inter-disciplinary program.

We feel that there has been an over-emphasis on professional roles. In other words, you've got a ten-member team who chops a kid into ten little pieces and you proceed to have little bits of data here, not a particularly functional relationship. Quite often the diagnosis has been - and the whole process has been - frozen in time, in which the child - in just a few minutes or an hour or so - you've found a little bit of data on the child. You've seen very little relationships performance outside of the clinical

situation. We are therefore directing ourselves to attempting to say that - really - the professional roles are not identified by disciplines. There is an awful over-lap here, and we should be looking at the problem in terms of who best at this time can do the job on the assumption that there are - when you're dealing with performance orientation, a number of disciplines who basically have similar skills.

It doesn't matter if the social worker, or the nurse, or the teacher is going to do the job. It's who at that time can best do it. Now obviously, the model that we are using is not the kind that would be used in general unlimited people. But we feel that essentially, we have got to shape them. We do have some medical people who are interested in being shaped, to some degree at any rate. The basis here is that - if we are going to do this - this kind of thing, we want a program where we are not going to institutionalize the children in any program, where we will see a continuum between the kinds of things the resource center is doing and anything that went on within the clinical services building. What they are doing out in the field has got to have a direct relationship to what kinds of things should go on in any clinical program that is housed in a building - that there would be a continuum here in terms of this kind of operation.

But obviously, to do this, we have to be in a position to have a problem-oriented group of people with whom we can knock heads, and then we would see the function of the University here. To put people of various disciplines into these kinds of situations - force them to be problem-oriented - by virtue of dealing with children, by having a group of people such as you have here who are fairly articulate and care about what they are doing and why. And they are doing it to force other people - particularly in the medical area, and social work and counseling and so on - to also come up with some new and more performance-oriented and realistic diagnostic and prescriptive methods. That is going to

take them. It is an involving and slow process.

As a University, we also will see that there are various levels here in terms of research. We would see behavioral scientists and people who would be called biological scientists who also ought to be knowing heads here in terms of the long-distance problems of physiological variables and behavioral variables. This is really why we are operating a clinical services program which we do not see children who are staying for long periods, but for flexible periods. So that if we, as the resource center out in the field, want some children who are required to come in for a period where we can - would like to - control some of the variables that operate out in the field, we can do that. But we will move these children back out into the community, since we feel that the clinical program must - and should be - related to the problems out in the field and should not become institutionalized.

We can have then, people within the University environment who can be looking long-distance at some of the kinds of problems. Some of the things that Jim has talked about - Jim Crosson - he might have the opportunity to knock heads with someone in the field of biology. That's our long-term reason for, I think, handling this kind of program. Not that we feel there is a contradiction here in terms of bringing these people in to this involvement (?), but recognizing that there are always dozens of children who require that kind of environment - we hope for limited periods of time. I think that is about it. Thank you.

Mr. Martinez:

Thank you very much. In a summary kind of comment, I hope it's been evident from the presentations by the speakers that the resource center project is intended to be a responsive support system for problem-solving, rather than just problems. One of the reasons I was very hesitant to leave Oregon, is that behind myself there

was a company of very competent individuals who have appeared here speaking at you.

The orientation at this point in the art, is not demonstrating - more specifically - is not to just do research, to get data in terms of the usual kinds of jargonese of the researcher, and to try and get around the very basic problem that we are so sensitive to. It is that many times we sit around talking about yesterday's research and making guesses about tomorrow, when in fact we are rather incapacitated to do business with today. This kind of data collection is the type of activity where we can compose studies and invent tests that have a real potential for getting a round-up. It is a matter of question asking and so forth, processing of information. It is a risky one, and I'll take a moment to demonstrate why it is one of the two that I know. Because the potential customer is a very complex sort of computer system, without asking the sales representative - although it could, in fact, respond to the kinds of questions he had. And the salesman assured him that yes, it was very much the case that the computer system would respond at a request. So he said, "Pick any question you want". So the fella wrote on a card and turned into the system, "Where is my father?" And the computer was whirring and the lights were blinking, and the words came out, "Your father is in Alaska fishing." The potential client said, "Well, you just blew it because my father has been dead for two years." The fella said, "Well, perhaps the system didn't understand the question. Re-word it, re-interpret it and put it back in again." So he wrote, "Where is the husband of my mother?" He put it in the machine again, and again the lights blinked and the gears whirred and the card popped out and said, "Youre right, the husband of your mother has been dead for two years, but your father is still in Alaska fishing." So there are some rather tricky kinds of problems that do come up in the fine art of asking the right kinds of questions and in processing data in such a fashion

that we do get some reasonable, handy responses. Do you have any, by the way?

I realise that it is about 6:00, but if you do have any questions for any of the folks here, I am sure they would be happy to respond.

Cooperation and Interaction of American and Canadian Special Education Instructional Material Center Networks

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One of the goals of the SEIMC Network is to create adequate channels of communication between special educators. The purpose of this presentation is to discuss the possible interaction and cooperation patterns which may be elaborated between the Canadian SEIMC Network and the American SEIMC Network.

To approach the problem in a logical way we will attempt to follow the phases of development of a Canadian SEIMC Network and discuss the lines of cooperation that could be established at these different phases of development. Phases of development might be categorized as follows: organization, testing, and production.

The first steps in establishing a Canadian SEIMC Network will involve determining the physical organization of the network. Decisions will have to be made concerning the location of regional and satellite or affiliated centers, and the territory to be served by each center. Many crucial questions will have to be answered. What would be an efficient way to organize lending services to special educators? What are the best means to reach special educators? What should be the general objectives of the network, and the specific objectives of each regional and satellite center? Should uniformity and/or diversity be favored in establishing objectives? What should be the autonomy of regional and satellite centers? Will it be advisable to adopt a uniform classification system for documents and instructional materials for all centers in the network? When should a search and retrieval system be integrated in the network? What kind of personnel will be needed in each centers? In this phase the crucial problem of finding funds to set up the network and to assure its operation will have to be confronted. Where should the funds come from? How could we get key persons interested in such a project? These problems and many other problems have already been tackled in setting up the American SEIMC Network. Without a doubt, the American experience could be extremely beneficial in planning and organizing a Canadian SEIMC Network. This initial phase could be characterized by intensive consultation between American and Canadian special educators who would organize and plan the diverse aspects of a Canadian SEIMC Network.

The second phase will consist mainly of trying out what has been conceived in the initial planning. Distributive services to special educators in the schools will have to be tested and evaluated along with the communication channels at the different levels of the network. It is very likely that satellite centers will have to be added

in certain regions. Objectives will have to be reconsidered and possibly modified or changed. There is no doubt that new problems will surface and that changes will have to be elaborated according to unforeseen needs and modified objectives. Although to a less intensive degree, it seems that American consultative services will still be very beneficial at this stage of development.

Once the communicative and distributive types of relationships are adequately established, the Canadian SEIMC Network will be in a position to emphasize the developmental, evaluative, and research phases of network operation. The Canadian SEIMC Network will then be in a position to produce and evaluate instructional materials, and to stimulate new ideas and techniques in teaching handicapped children. Contributions could be expected in the following areas of exceptionality: mental retardation, emotional disturbance, learning disabilities, speech impairment, physical handicaps, visual handicaps, deaf and hard of hearing conditions, social maladjustment, socially disadvantaged conditions. It appears however that certain problems may very well receive special emphasis. Education of minority groups such as Indian and Eskimo populations present significant problems for investigation. Speech problems in bilingual communities need to be examined. Such problems as may occur when a second language is learned, and the advantages or disadvantages of learning a second language at an early age, need further intensive research. French communities might see as a priority the production, evaluation, and adaptation of instructional materials and standardized tests for French speaking children. The innovation and implementation of new concepts in the establishment of services for handicapped children (example Dunn's model, Dunn 1968) may yield valuable information for upgrading present services. A Canadian SEIMC Network will also represent a powerful tool for the coordination of efforts in the expansion of Special Education throughout Canada. Most of the efforts in Special Education in Canada are carried out on a provincial basis. At this time, the creation of a National body will establish a communication channel among provinces and should encourage and result in more effective cooperation and coordination.

At this stage of development, cooperation between American and Canadian SEIMC Networks might change from a consultative pattern to a mutual-exchange interaction pattern. The cooperation model for the different phases of development might best be expressed in Figure 1.

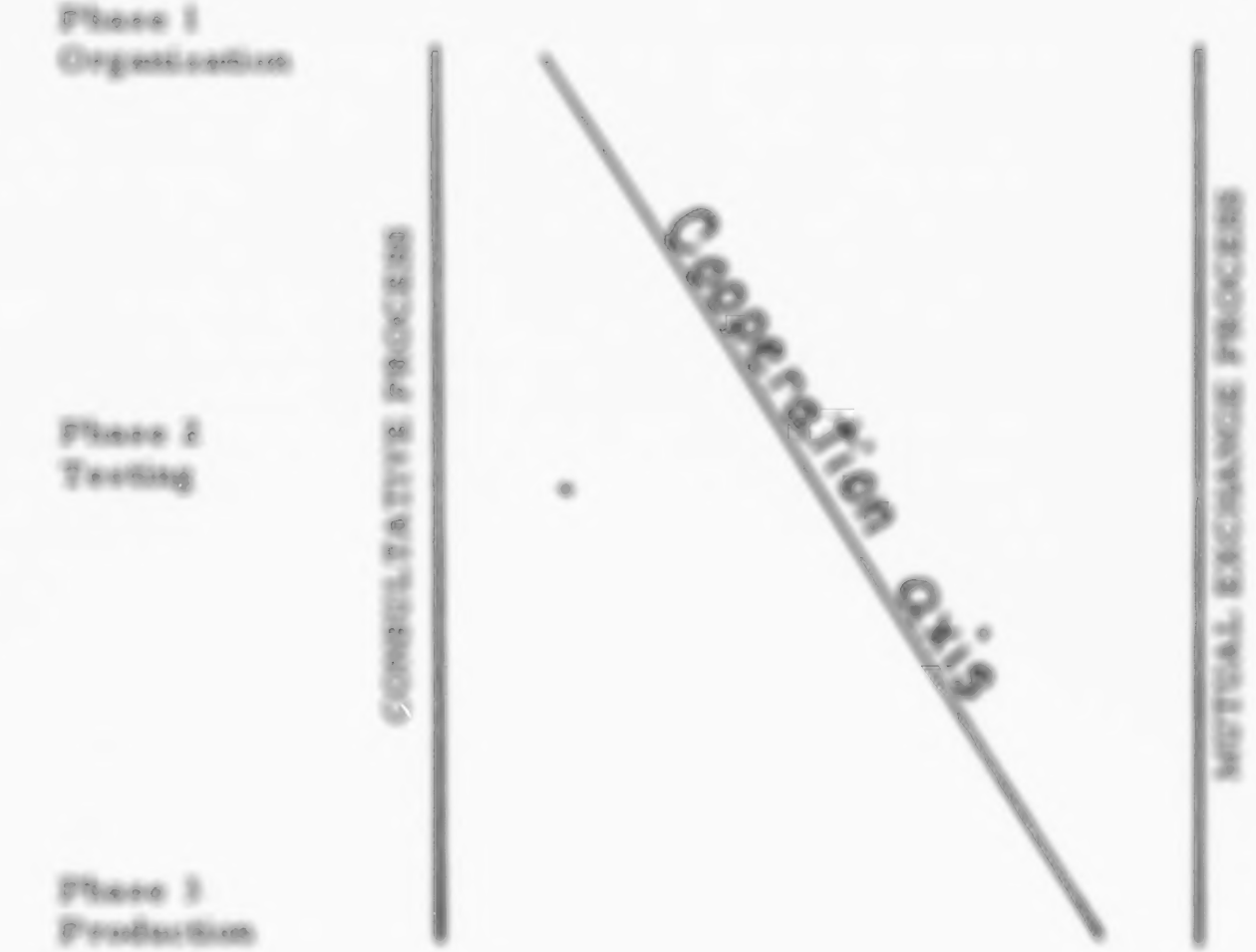
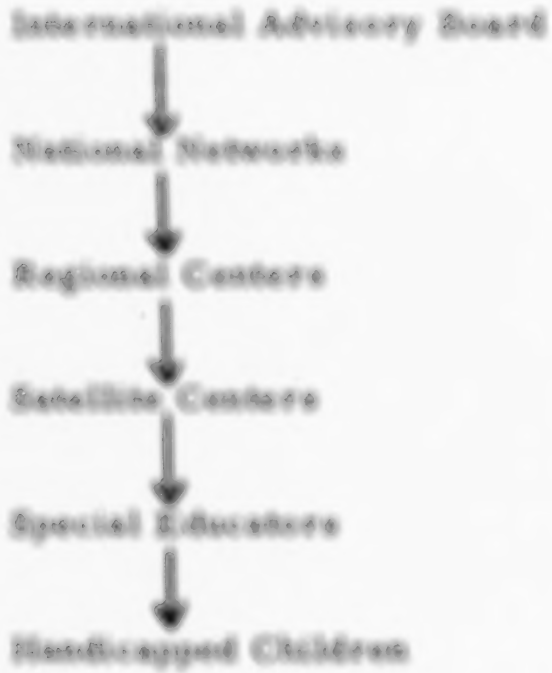


Figure 1. Cooperation model.

This model attempts to show how cooperation between American and Canadian EEIbC Networks will shift from a consultative process to a mutual-exchange process as the Canadian Network operation becomes more effective and produces new interaction patterns.

Means of Cooperation:

There are several ways in which cooperation between an American and Canadian EEIbC Networks might be encouraged. First from a structural point of view, the creation of an International Advisory Board might stimulate and facilitate cooperation between National Networks and help the development of new networks systems. The structural hierarchy might then develop as shown on the following page.



Additional objectives of an International Advisory Board would include an organized exchange of personnel within and between national networks. In a similar way it may foster interest and research among different regional centers. The Advisory Board could form joint committees involving members from national networks to study and report on special education problems. It could also devise means facilitating an exchange of materials between networks. In summary we may say that the main purpose of an international SEIMC body will be the creation of communication and cooperation channels between national networks, and overcoming communication barriers which hinder exchanges between national networks.

The conceptualization and implementation of the SEIMC Network in America is probably one of the greatest achievements in the field of Special Education in the past decade. The next decade might see the expansion of SEIMC Network to other countries of the world and set the stage for an International SEIMC Network.

References

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